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Report of the Royal Commission on Metropolitan Sewage Discharge.

AGREEABLY to the intimation made in a brief notice in the *Builder* of the Report of the Royal Commission shortly after its publication at the close of last year, we proceed to lay before our readers a summary of its contents, dwelling more particularly on some of the interesting facts elicited in evidence, which, until clearly established by more recent and special observations, have not been generally apprehended.

The Report certainly justifies the interest with which it has been awaited, while the quantity and quality of the evidence collected together testifies to the laborious and careful manner in which the inquiry has been conducted. Commencing with a most complete history of a question which has been in agitation more or less for forty years, the Report proceeds with an exhaustive explanation of the circumstances which led to the adoption of the system now existing, and closes with suggestions of a possible solution of the problem which has hitherto baffled the ingenuity of many of the cleverest minds in England. That the problem still remains unsolved indicates the extreme difficulty with which the question is surrounded, the principal cause of that difficulty being undoubtedly the unavoidable necessity of remedying rather than removing existing radical defects, and the impossibility of dealing with it on an entirely new basis. Were it practicable to sweep away all the unfortunate arrangements of our forefathers, and to commence *de novo*, the problem could be worked out with comparative ease; but, as the Commissioners observe, so drastic a proceeding would involve not only an enormous expense, but would necessitate so much interference, and give rise to so many inconveniences, that it would create an opposition which it would be impossible to overcome.

The attention of the Commissioners was directed to three distinct subjects of inquiry,—

1. The system under which sewage is discharged into the Thames by the Metropolitan Board of Works.

2. Whether any evil effects arise therefrom; and

3. In that case, what measures can be applied for remedying or preventing the same?

Dealing primarily with the first two of the subjects, the First Report, which was issued at the beginning of last year, is confined to the conclusions resulting from the evidence taken on these two points. As the Metropolitan Board of Works considered the inquiry almost equivalent to putting them on their trial, that body applied for permission to appear by counsel, and as such a privilege could only be granted alike to all the parties interested, the Commission to all intents and purposes constituted a Court before which the most eminent counsel exercised their talents in pleading for their respective clients. But may it not be asked here, Is such a method of conducting an inquiry absolutely indispensable? Is it not possible for a Parliamentary Commission to be so constituted that its members should be capable of taking evidence and forming a judgment thereon without all the tedious accompaniments of cross-examination, and, in many cases, the futile attempts to confuse a witness and lead him to contradict himself on points of detail, which, after all, affect but little the main issues? It is impossible for an outsider to read the evidence in the present instance without perceiving that many questions were put to the various witnesses, not so much for the purpose of eliciting information as for trying to invalidate previous statements, though such had been made by experts thoroughly conversant with the subject on which they had been examined. A style of cross-examination adopted towards witnesses of the "Winkle" type is scarcely suitable to be used towards professional men of acknowledged ability and experience like Mr. Baldwin Latham, and it is surely matter for regret that counsel should be allowed to occupy the time of the Commission in endeavouring to prove that the "recorded observations" of such an authority are "absolutely worthless," and "as not worth the paper they are written upon from beginning to end." That it was sheer waste of time is clear by the Commissioners' decision that though there might be apparent anomalies in the recorded observations of Mr. Latham, arising from accidental causes, "there is no doubt of their good faith, and, as a whole, of their bearing evidence of trustworthiness, and as representing what they professed to represent."

Part I. of the Report commences with an historical notice in regard to the drainage of London of all the measures proposed or adopted from the beginning of the sixteenth century to the present date. Never before has a record of this subject been presented in so complete and readable a shape, and its perusal serves to show under what great difficulties and amidst what conflicts of opinion the existing drainage system had to be decided upon. The needs of our metropolis, moreover, had thirty years ago become so urgent that the Metropolitan Board of Works were compelled to undertake some scheme without further delay, and though its weak points have since become apparent, the Commissioners have recorded their opinion that, under the pressure of the attendant circumstances, the Board were justified in adopting Sir J. Bazalgette's design; and further, that whatever differences of opinion there may be as to particular parts of that design, there is no question as to the excellence of the construction of the individual works.

The total cost of the Main Drainage works, according to the Board's Report, amounts to 4,600,000*l.*, while the cost of the "further relief works and extension of the reservoirs" is estimated at 1,650,000*l.* more, raising the total expenditure to 6,250,000*l.* as against the original estimate of Messrs. Bidder, Hawksley, and Bazalgette of 2,300,000*l.*, and of the Referees' alternative scheme of 5,437,000*l.*

Before, however, the present scheme was finally adopted, it was submitted to the consideration of a committee of Referees, who, while agreeing on the main principle,—that of interception from a higher level, and pumping from such levels as were too low for a gravitating discharge, yet differed as to the details in which those principles should be carried out. The most important modification of the Referees was as to the discharge of the sewage, in removing the outfalls to a point much lower down the river, where it would be rapidly and certainly mixed with large volumes of water and be finally carried into the sea. That plan necessarily involved a large amount of work, and a proportionately increased expenditure, as noted above. Their Report was severely criticised by the advisers of the Metropolitan Board, who strongly objected to the scheme of the Referees, and ultimately rejected it under pressure from the principal Vestries and District Boards, and, as it has proved, under the mistaken conviction that the ratepayers would be unduly burdened by its costliness. As events have turned out, however, the wisdom of this objection has not been justified, for the very evils which the Referees predicted, and which their recommendations sought to avoid, have come to pass, while the cost for remedying them will, even if the estimates are not exceeded, surpass that of the Referees by nearly a million sterling! It is little wonder, then, that the controversy is not yet closed, and that it has been scarcely yet divested of the "acrimonious and personal tone" which it had assumed in its early stage.

The weak points of the present system are represented to be (1) the necessity for a large provision of storm-outlets, and (2) the discharge of the sewage in its natural crude state. On the first point, notwithstanding the statements of the Board's advisers to the contrary, the Commissioners justly arrive at the conclusion

that it is impossible to lose sight of the important fact that an expenditure is now going on of the large sum of 1,500,000*l.* for additional "relief sewers" with storm overflows discharging within the metropolis; and that "the discharges of sewage from the storm overflows are frequent and considerable, and that they are occasionally of very offensive character."

On the second point the Commissioners observe that it was always understood that deodorisation would be resorted to, and that it is owing to the failure to carry it out that the Board of Works is now blamed. How far the evil is remediable is discussed in their second Report.

The next subject of interest treated is the distribution of the sewage in the river by the various motions of the water. Its importance is evident from the fact that no less a volume than 19,000 cubic feet per minute is discharged into the river at the two outfalls of Barking and Crossness, and, of course, the interest of the question lies in what becomes of that large volume of sewage after it enters the river, and in what manner it may be distributed about by the various hydraulic currents it encounters there. Herein lies the crucial point of determining the best position for the outlets, and round this, as may be supposed, the battle of the contending parties has most fiercely waged. As, however, a settlement of the question does not depend on any theory, but can be arrived at only by a series of experiments and observations of actual facts, there is, seemingly, not much room for divergence of opinion; nevertheless those very observations, specially carried out for the Committee by Mr. Latham, were sought to be branded as "worthless." So far from being unreliable, the Commissioners declare that they clearly demonstrated the extent and range of the tidal oscillations,—the maximum range recorded at spring tides being 18 miles and the minimum at neap tides 7 miles, the mean of the whole being about 12½ miles. Floats started from the northern outfall at varying stages of the tide ascended, with subsequent flowing tides, to distances of between 7 and 22 miles, clearly proving that, at whatever time of tide the sewage is discharged, some of it may, under certain conditions, be carried up by the tidal oscillation alone into the heart of the metropolis, and even further.

There is, however, another force in operation termed "the mixing action," that is, the gradual commingling of the fresh with the salt water, which very materially influences the distribution of the sewage in the river. The proof of this action, and at the same time the means of its quantitative determination, are, it is said, furnished by the amount of *chlorine* in the water, so that the relative quantity of sea water, land water, and sewage can be determined in a given sample of river water, and this discovery has led to the detection of sewage having been carried with the "mixed water" as high up even as Chiswick. But the most startling result indicated by the chlorine test is that the proportion of the sewer liquid contained in the river in the neighbourhood of the outfalls approaches in dry seasons to one-sixth of the volume of the river! The Metropolitan Board, however, assert that a wide distribution of the sewage is favourable to its more rapid oxidation and purification, and that, therefore, in time the discharged fluid is deprived of its offensive properties. This may be admitted, but manifestly the value of the assertion is limited by the time which must elapse before the nuisance ceases.

In regard, then, to the evils resulting from the existing systems of discharge, while declaring that there has been no evidence to lead them to believe that any substantial nuisance attributable to the metropolitan sewage is complained of below Gravesend or above Greenhithe, yet the Commissioners say that it is impossible not to be satisfied of its real existence, and that the effects of the sewage discharge are more or less apparent at all times; that from a considerable distance above to fifteen miles below the outfalls fish have disappeared from the river; and that though there is no evidence of any evil results to the navigation of the Thames by deposits from the sewage discharge, yet that this discharge adds largely to the quantity of *detritus* in the river.

Besides receiving the evidence of others, the Commissioners took the evidence of their own senses by personal inspection of the river, during the summers of 1883 and 1884. The evils which existed in 1883, when there was an abundance of land water diluting the sewage, were found to be greatly intensified during the exceptionally dry season last year. The proportion of sewage liquid in the river near the outfall, which in 1883 amounted to nearly 12 per cent., reached last year 17 per cent. at high, and 28 per cent. at low water. Even within the metropolis it was found at high-water as large as 6 per cent. The sea-water also penetrated as high as Chiswick, that is, 50 to 60 miles from the mouth of the river, and then with a reduced inflow of land water the sewage remained a much longer time in the river before being carried out to sea, so that with the constantly accumulating discharges it culminated in virtually rendering the Thames, between the months of June and September, a huge cesspool, which, in the words of one of the Commissioners, was "a disgrace to the metropolis and to civilisation." It was time, indeed, to declare that "the public interest requires that a remedy should be applied with the least possible delay."

Valuable and interesting as is all the information contained in the first Report of the Commission, yet the attention of the public is more particularly concerned in the views and decisions on the third point of their inquiry, the measures to be applied for remedying or preventing the evils resulting from the present system,—in other words, the *disposal of the sewage*. It is almost with a feeling of disappointment that we read, that after taking the evidence of twenty-seven witnesses, and themselves personally inspecting the various processes actually practised in various towns, the Commissioners feel themselves "compelled to express their regret at the obscurity in which, after so many years' study and discussion, and after the large experience that has been gained, the subject of sewage treatment appears to be still involved," and that they, therefore, "conceive that their duty will be best performed by stating the various plans that have been proposed or suggested as possible remedies for the existing evils, adding such remarks as seem to be useful in forming a judgment upon them." There is an uncertain ring in this declaration which seems to convey an impression that the Commissioners themselves are not perfectly satisfied as to the successful issue or the finality of the measures they suggest. In so far that it brings all the various proposals under one view, and discusses their respective merits, the Report is valuable in enabling the public to judge of those merits; but there is an absence of the authoritative prescription, the result of experimental conviction, which alone can command entire confidence in the skill of the physicians called in to consult over a desperate malady. Perhaps the public must rest satisfied with the completeness of the diagnosis, and trust that the remedies which have been suggested rather than prescribed will work the desired cure.

Before examining the various proposals which have been made for the treatment of the metropolitan sewage, the Commissioners discuss two points which have a very important bearing on the question:—

1. The separation of the sewage from the rainfall; and

2. The prospect of profit by the utilisation of the sewage.

As has already been observed, the impossibility of carrying out the first in the case of the metropolis owing to the necessity it would involve of remodelling the whole of the house drainage at an enormous expense, constitutes the main difficulty to be encountered in designing an effective sewerage scheme; but there is no reason why the "separate system" should not be carried out in all extensions of the metropolitan area. The preponderance of the evidence is conclusive on this point. For though it is quite true that surface drainage, both from town and agricultural areas, must contain more or less impurity, still by its separation from the actual sewage it allows of the latter being more easily and economically dealt with in its concentrated form.

The second point has given rise to a great deal of discussion, but the logic of facts has led to the almost universal conclusion that, as far as actual experience goes, the positive manurial value of town sewage is so small as not to be worth the cost of carriage, even for moderate distances. Except in very occasional cases, as for instance that of Edinburgh, which, according to Sir R. Rawlinson, could not be applied to the Thames, the application of sewage to land has not been attended with the profits anticipated. Mr. Latham particularly quotes the case of the Croydon farm, where as much as 12,000*l.* have been lost in some years, notwithstanding its favourable position for the disposal of the produce raised.

The only plan hitherto attended with any really successful results is that practised by Mr. Bailey Denton, whose book on the treatment of sewage by "intermittent filtration" was lately reviewed in the *Builder*.

As regards chemical treatment, with the exception of the Aylesbury farm, regarding which, as the Commissioners observe, there is something very unintelligible in the value claimed for the precipitate, the conclusion arrived at is that it is not probable that any marketable manure can be obtained by it, the only possibility being that the precipitated matters might be made to yield some little return in diminution of the cost, and even that is problematical.

On the whole, considering the fact that sewage does contain elements of value, and that the aggregate quantity of the metropolitan sewage is so large, the Commissioners are of opinion that the possibility of realising some of that value should be borne in mind in devising plans for its disposal, and that, as far as is yet known, its application to land seems the probable mode by which this can be done, but that proceedings to free the Thames from pollution must be undertaken *irrespective of the question of cost or returns.*

While inclining to that belief, the Commissioners proceed to discuss six possible remedies which have been suggested for the evils of the present system of discharge:—

1. The principle known as "Broad Irrigation."

2. Filtration through porous land.

3. Clarification and consequent partial purification.

4. Precipitation and subsequent application to land.

5. Removal of the outfalls farther down the river.

6. Removal to the actual sea coast on the north side.

On the first head the conclusions arrived at are, that although applicable and possibly satisfactory, as well as profitable in the case of small towns, it would be impracticable in the case of the metropolis, owing to the vast area of land required, viz., 40,000 acres, at the lowest computation.

The second remedy the Commissioners think might, with some modification, be applicable, inasmuch as the process seems to be more efficient and certainly more economical in the item of land.

As regards precipitation processes, they would certainly effect an improvement on the existing state of things, but they are insufficient of themselves to purify the river. The annual cost would be at least 200,000*l.*, equal to 1s. per head of the population; but its great advantage consists in the ability to bring it into immediate operation, and, when desired, to discontinue it at a comparatively small loss.

A combination of precipitation with filtration through properly-prepared land the Commissioners believe to offer the most feasible, though somewhat expensive, means of solving the problem, for thereby the objection to simply chemical treatment will be obviated by removal of the cause of injury to fish and of danger of contamination of the adjacent subsoil.

As regards the fifth remedy, the Commis-

sioners conceive themselves warranted by the evidence in stating that it would be advisable to remove the outfalls to a point lower down the river than that named by Sir J. Bazalgette, and where facilities are asserted to exist for clarification; but they pronounce emphatically against the admission of sewage in its crude state into any part of the estuary of the Thames from the Nore upwards, though, if properly clarified, it might be discharged below Hole Haven without risk of serious nuisance.

On the sixth remedy, as proposed in the scheme projected by Messrs. Maclean and Stileman in 1849, and condemned by the Referees, to whose notice it was submitted in 1857, and as contained in a similar proposal by "The Metropolitan Sewage and Essex Reclamation Company," though supported by Mr. Latham, the Commissioners pronounce a decided negative. A *résumé* of the conclusions and recommendations of the Commission may be stated shortly thus:—

That it is unnecessary and unjustifiable to discharge crude sewage into any part of the Thames, but that processes of precipitation or deposition may be conveniently applied at the outfalls, and the liquid resultant may, as *a preliminary and temporary measure*, be suffered to escape into the river between high water and half ebb of each tide, the orifices being not less than 6 ft. below low water of lowest equinoctial spring-tides; but for a *permanent* measure that liquid should be further purified by intermittent filtration through land, of which, it is believed, sufficient may be found near the outfalls, and if not, then the sewer liquid should be carried down to at least as low as Hole Haven.

These recommendations were criticised by Captain Galton in his recent lecture before the Society of Arts as dealing insufficiently with the fact of the ever-varying strength of the sewage liquid, and with the increasing volume which will have to be dealt with, estimated at 35,000,000 cubic feet in twenty years; also that if the final result of the deodorisation and filtration is to return only a portion of the effluent pumped to the river at a present cost of 4,500,000*l.*, which will have to be increased at no distant date to 6,000,000*l.*, additional to the 1,500,000*l.* now in course of expenditure, it might be simpler and cheaper to adopt the plan of modified deodorisation suggested by the Referees, *i.e.*, dilution of the sewage combined with its flow through many miles of long tidal channels at a cost of 2¼ millions sterling.

Inasmuch as the principal difficulty of dealing with the London sewage arises from the concentration of so exceptionally vast a mass at two points on the river, it seems to suggest the advisability of not attempting to deal with the *whole* of that mass in any one particular mode, or by any single process. Is there any real impediment to dealing with it in detail, and so availing ourselves of more than one of the several processes, which, although not strictly and commercially successful, have nevertheless practically mitigated the difficulties of sewage disposal? It is acknowledged on all sides that the nuisance must be got rid of at any cost, and as quickly as possible. Would it not, then, be practicable to commence with deodorising and precipitating processes of say one portion of the present volume, carry off another portion on the plan of the Referees, and convey a third right away to the coast, as recommended by Mr. Latham, to be there utilised by private enterprise? By thus dispersing the volume the difficulty of dealing with the accumulated quantity at *one* point is removed, and the practicability of obtaining some value for the manurial residuum in diminution of the annual outlay rendered more possible and feasible. On the principle of dividing an enemy's forces, and beating them in detail, may not the metropolitan difficulty of sewage disposal be thus overcome?

Though the suggestions of the Commission can scarcely be said to amount to a definite solution of the problem set before them, yet the public are much indebted to them for their very able, exhaustive, and interesting Report.

NOTES.

IT seems that the railway rates question is once more to be referred to a Royal Commission. Mr. Chamberlain stated in the House on the 13th that the railway companies had agreed to this course being adopted, providing that the inquiry be limited to rates and terminal charges without prejudice to other matters. Mr. Chamberlain suggested that the Commission should consist of the Railway Commissioners and two representatives of the railway companies and the traders; intimating also, that the question of preferential rates would be made the subject of special legislation. Both the Railway Association and the Railway and Canal Traders' Association held meetings on Monday last to consider this fresh aspect of affairs. The former merely passed a resolution pressing upon the Board of Trade the necessity of two disinterested statesmen of eminence being appointed members of the proposed Commission; while the latter considered it inexpedient and unfair to send the Bills to a Royal Commission at all, as such a course would entail on opponents all the expense that would be incidental to a contest before a Parliamentary Committee. Their opinion as to the scope of the inquiry is that it should be limited to the cost of conveyance of the articles scheduled in the Bills and the rates charged for such articles in England and other countries, in order to arrive at a just basis for a uniform classification. It, therefore appears extremely unlikely that the matter will be settled for some time to come, as these inquiries have always proved to be very protracted, and there are already indications of difference of opinion as to the constitution and duties of the Commission.

THE proposal of a Royal Commission on Railways, to be built out of the elements of the existing Railway Commission, two representatives of the traders and freighters, two representatives of the railway managers, and two (if such can be found) of the independent wealth and statesmanship of the country, is of course an improvement upon the prospect of an interminable series of contests before nine or ten committees of each House of Parliament. But it is, at the best, an *amateur* treatment of a great national question. A commission, or a committee, as generally constituted, may, to a certain extent, thrash out the facts, but it does so in the form of a squabble. The anxious care that the members of the committee who represent the interest A sometimes take to close the mouths and discredit the testimony of the witnesses called by B, is, in cases easy to point out, nothing short of scandalous. Opposing counsel sit on the bench, and try to guide the case each in his own way. In France, Germany, Italy, or almost any other civilised state, the first step to be taken in such a question is to call for the report of a competent expert. Were this done now, or even, if there be difficulty in fixing on a man of sufficiently commanding character, were two reports called for, one from the companies and one from the traders, a judicial body, however constituted, would have the materials for a calm investigation placed before them, far better than by the *ex-parte* statements of hostile counsel. An indefinite amount of time and of cost would be saved. And there would, at all events, be the satisfaction that this great question was attacked, rather with a view to its equitable solution, than as a scramble among opposing interests.

LORD CAMPERDOWN'S Bill for the regulation of powers of water companies, which passed the second reading on Tuesday night, and will probably be referred to a Select Committee, paves the way for a very desirable check on the powers that companies now possess of cutting off supplies for non-payment of rates in advance. No doubt the companies have to do with a certain proportion of troublesome customers, but, as the Lord Chancellor observed, they have obtained the practical monopoly of one of the first necessaries of life on very favourable terms, and the very moderate proposition in the Bill, that a company should not cut off the supply except on obtaining powers to do so from a magistrate or from some court of summary jurisdiction, will furnish exactly the amount of check which is wanted to protect the consumer from oppression, while leaving it open to companies to obtain power of summary procedure in cases where they can show good cause for it. The pretence of the Bill being an oppressive one to the water companies is absurd.

THE case of Spackman *v.* The Board of Works for the Plumstead District, decided by the House of Lords on the 26th ult., and to which we have before referred as being of considerable importance to builders, is also of importance as giving increased weight to the decision of the Superintending Architect to the Metropolitan Board of Works as regards the general line of buildings. The appellant Spackman had been summoned before the Magistrate of Greenwich Police-court under the 75th Section of the Metropolis Management Amendment Act, 1862, in respect of certain shops erected by him in Lee High-road, which were alleged to be in advance of the general line of buildings in that road. The Magistrate had decided in the appellant's favour on the ground that the certificate of the Superintending Architect was not binding on the Magistrate, who heard evidence and inspected the premises, and was of opinion that the buildings were not in advance of the true general line of buildings. This decision was reversed by the Queen's Bench Division on the ground that the certificate did bind the Magistrate. The Court of Appeal confirmed the decision of the Queen's Bench and remitted the case to the Magistrate to direct the demolition of so much of the buildings as were erected in advance of the general line as certified by the Superintending Architect. The case was carried to the House of Lords with the result that the judgment of the Court of Appeal was upheld.

THE effect of this decision will be to materially increase the responsibility of the Superintending Architect, who will no longer be the assessor appointed to assist the Magistrate in the case of disputed lines of frontage, but the virtual judge or arbitrator, and the only duty of the Magistrate in these cases appears, from the judgment of the Lord Chancellor, to be to register the decisions of the Superintending Architect, and to make orders for the removal of buildings erected beyond the general line of buildings. It would further appear that not only has this officer power to determine the general line of buildings in the case of buildings actually erected, but that he may also define the line with respect to buildings proposed to be erected. This will be a considerable advantage, as hitherto it has been held that the Superintending Architect was not empowered to define a line except when some building had been erected in advance of the general line of buildings. In the Lord Chancellor's own words:—"If the matter is to depend upon the Justice, the builder and the Board cannot go before the Justice until the building has been erected, and you have the same inconvenience which arose under the Act of 1855; whereas, if the Superintending Architect is to decide, the two parties may settle any question before him before any expense has been incurred or anything has been done." The decision of the House of Lords gives the Superintending Architect a power possessed by no other judge or tribunal in the kingdom, as his decisions are, practically, without appeal, provided, as the Lord Chancellor observes, his judgment was honestly given and the necessary preliminary formalities had been complied with.

IN Mr. Shaw Lefevre's evidence before his own Committee on the restoration of Westminster Hall, he stated that "the completion of the Westminster Palace according to Sir Charles Barry's design might be understood to be given up." Who has given it up, and when? That it will be deferred is likely enough. The object now is to prevent any-

thing being done which will stand in the way of its completion. The proposed "cloister" treatment of Westminster Hall, as now seen in the model, would not do so, though we regard it as "playing at architecture"; the paltry new building, proposed to stand at right angles to the north end of Westminster Hall, *would* stand in the way, and, as the Committee have not ventured to erect a canvas representation of that structure, we hope we may regard that as "given up." The completion of the cloister design, if carried out, and if Westminster Hall be left exposed to view, would emphasise the discrepancy between the scale of these details and those of Barry's building. The public who take any interest in architecture will hardly support the idea that the completion of a great national building is to be declared impossible because the Ex-First-Commissioner of Works does not like to be contradicted.

DISCOVERIES of considerable interest have recently been made at Eining, which is, presumably, the site of the ancient town Abusina. The excavators have lighted on a large Roman villa with extensive baths. Besides countless architectural matters, which in the arrangement of the heating apparatus have considerable technical interest, relics more distinctly human have been found. Among these are the skeleton of a woman, with by her side a jug, a glass urn, and tear-bottles, the last offerings to the dead; also the apparatus of her toilette hair-pins, pearl necklace, and bracelet; some slight sculptural remains, a woman's head in marble, and a votive stone to the honour of "Dea Fortuna Augusta Faustina," with an inscription of four lines; also a number of weapons, coins, rings, fibulæ, spoons, and some tiles with Roman stamps.

IN the course of excavations at the Propylæa at Athens a number of cornice mouldings, made of porous stone, have been discovered. There seems little doubt that these belong to the older Propylæa, and that when the new building was erected, in the fifth century B.C., they were used, as was so often the case, as building materials. The stones are in excellent preservation, and have been brilliantly coloured in red, blue, and gold. They will, therefore, serve as valuable instances of decorative architectural painting. The account of these discoveries in the "Berliner Philologische Wochenschrift" is accompanied by a sketch of the south wing of the Propylæa, conjecturally restored and seen from the south-west. The new restoration, based on these recent discoveries, differs materially from that of Bohn, but the sketch given in the German paper is so exceedingly bad and meagre that it is hardly worth dealing with seriously.

A NEW society of artists is about to be founded at Paris, that of the Pastellists. Besides other eminent names among its founders, we notice those of MM. Baudry and Boulanger, of the Académie des Beaux Arts, and those of MM. Cazin, G. Dubufe, Duez, Jules Lefebvre, Émile Lévy, Th. Rousseau, and Mdme. Madeleine Lemaire. The society, of which M. Roger Ballu is President, will open an exhibition in the April of each year, at the rooms of M. Georges Petit, its vice-president, in the Rue de Sèze. The first exhibition will open on the 1st of April next, and will include a very interesting collection of works by French masters of the last century.

THERE are some very good pictures to be seen at Messrs. Arthur Tooth & Son's Galleries in the Haymarket, notably two by Gérome, "In the Desert" (26), and "The Bath" (109). The first represents a bright bay Arab horse lying with his head in his master's lap, apparently fallen from exhaustion; the horse is "end on" to the spectator, and the drawing and painting of the animal in this extremely difficult position form a triumph of technical power such as is not often met with. "The Bath" represents a blond girl kneeling on a seat by the bath waiting to receive a douche from a negro attendant in bright orange turban. Neither picture has a grain of feeling; but, as representations in painting of the human animal and the equine animal respectively, they are perfect. Among other painters represented are Edouard Frère, Israels, Van Haanen, De Blaas, Dendy Sadler, Leader, Brett, Heffner, Th. Weber, &c. There are some good small architectural bits, especially a "Venice" by R. Senét. Four hunting-pictures, by Mr. T. Blinks, representing "The Run of the Season," are admirable studies of dogs in varied action.

THE proposal of Lord Brabazon, on behalf of the Public Garden, Boulevard, and Playground Association, to find work for the unemployed in laying out afresh squares and other places which are now in a neglected state, is a suggestion which may be said to be sound as well as philanthropic. The amount of work to be found is, of course, limited, but a good deal may be done with permanent benefit to the community. A lady has given 1,000*l.* to be expended in this manner, and Lord Brabazon hopes to find other funds forthcoming.

THE collection of Frederick Walker's water-colour drawings at Mr. Dunthorne's Gallery, in Vigo-street, is not quite as important or complete as we had been led to suppose, and we looked in vain for some well-remembered favourites. But even so much of Walker's work as is shown here is enough to afford more matter for study and pleasure than most exhibitions of a much larger size afford; there is nothing that is not masterly in its way. It serves to remind us again, rather sadly, what a genius was lost to English art, and what a great career cut short, by Walker's early death.

AT the Fine Art Society's room is to be seen a charming collection of sixty-three drawings, by Mr. Alfred Parsons, illustrating "Shakspeare's River." These are various sketches on the Avon, many of them rather finished drawings, illustrating some beautiful bits of English scenery, and some of the best qualities of landscape art on a small scale. An account of the trip, given by the artist in a pamphlet accompanying the catalogue and embellished with some woodcuts, furnishes a general commentary on the collection, the drawings of each place mentioned being identified by marginal numbers.

AT the business meeting of the Institute on Monday, when a memoir of the late Mr. Hadfield was read, a number of his designs for churches were exhibited, which illustrate some of the best class of work of the Gothic revival, now a thing of history, but still dear to the memory and associations of many of us.

IF the drawings by Mr. G. W. Allan, member of the Scottish Water-Colour Society, which are now on view at Messrs. Dowdeswell's, represent anything like the average level of work among the members of that Society, it is artistically in a very flourishing condition. Mr. Allan has collected a series of drawings made in Venice, Spain, France, England, and Scotland, his native country rather predominating in the selection. These are drawings in a genuine water-colour style,—free, broad, and powerful for the most part; and many of them are of considerable interest to architects from the admirable delineation of some out-of-the-way bits of picturesque architecture with which few people on this side the Tweed are practically acquainted. Among these are the drawings of "St. Monan's Parish Church" (49); "Old Town Hall, Crail" (34); "Pittenweem Parish Church" (7); "High Street" of the same little town (47); and the better known "Elgin Cathedral" (1). There are some good Thames and Venetian studies also.

THE "Society of Lady Artists" opened their annual exhibition in Great Marlborough-street this week, the private view being last Saturday; but we regret to say the quality of the exhibition does not tend at all to modify the opinion we have before expressed that no good artistic object is served by the existence of the society. Scarcely any of the really able lady artists of the day are represented there at all; and the few works which one pauses to look at are all by those who do not require a special society to make them known (Miss Kate Macaulay, Miss Linnie Watt, Mrs. Marrable, and others). The bulk of the work only shows that there are a good many ladies who take pleasure in painting, but who would have no chance of a place in high-class general exhibitions. Any woman who has attained real artistic mastery and power can find a place for her works in general exhibitions, by the side of the works of men, "without distinction of age or sex." There is no pretext, therefore, for saying that women need an exhibition of their own to make their talents known. The majority of the works that are hung here would be refused in the best exhibitions, not because they are by women, but because they are deficient in artistic power and interest. Then why exhibit them?

THE erection of the new buildings at the High School, Edinburgh, as formerly described in these columns, is meeting with considerable opposition. At a meeting of the Committee of the Town Council an opinion was expressed that the erection of the proposed gymnasium and janitor's lodge would destroy, to a certain extent, the architectural completeness of the building, and proposals were made as to the propriety of taking active steps to prevent their being erected.

IT is not generally known that, according to the original plan, Princes-street was to have a continuous row of buildings on both sides. This was most fortunately prevented, but a beginning was made at the east end by the erection of what are called the new buildings, to the west of the General Post Office. The back of these buildings faces the west, and is far from sightly. The ground immediately behind them, which was occupied originally by stables, &c., has been acquired by the North British Railway, and upon this ground the Company proposed to build a hotel. This proposal caused an outcry from neighbouring proprietors, but it appears that the city does not possess a servitude over the ground. The erection of a hotel here would, if carried out in an appropriate manner, form a happy termination to the east end of this fine street. A proposal has been made that advantage should be taken of the proceedings of the railway company to have the line of frontage of the new hotel thrown back to the same line as that of the north façade of the Post Office, an improvement much needed at a point where there is frequently a conjunction of traffic, and which, if not carried out, may be a subject of lasting regret.

IT has been determined to remove *en masse* to an adjacent site the large house in Whitehall which was lately occupied by Lord Carrington. Careful estimates have been prepared, the necessary funds have been provided, and the responsibility for the work has been placed upon Major-General Sir Andrew Clarke, R.E. The house stands upon Crown property, and is one of the very few domestic works of the architect, Sir Wm. Chambers, which remain intact. Its exterior presents nothing architecturally remarkable; but the beauty of the interior is well known, and was partially illustrated a few months ago in the *Builder* (Aug. 9, 1884). There has of late years been too much activity on the part of the destroying angel, and many houses of great historic interest (amongst them the several residences of Milton, *e.g.*), which might have been wisely preserved for our posterity, have wholly disappeared. It is time that some effort should be made in high places to discountenance the wholesale destruction which has heretofore been going on around us. It is, therefore, with peculiar satisfaction that we regard this attempt to save from the spoiler one, at least, of the many characteristic works of our ancestors. It is estimated that structures of the class to which Lord Carrington's house belongs, may be removed bodily for one half the sum they would cost to rebuild. The intended experi-

ment in Whitehall, although common enough in America, is a novelty with us, and will be watched with general curiosity.

THE Burlington Fine Arts Club have got together in their well-known room a very valuable and interesting collection of examples of Persian and Arab art, the aim of the exhibition being to illustrate especially the more important phases of the art of Persia, "and its effluent arts of Damascus and Rhodes." Ceramic art is most fully represented; but there are also some beautiful examples of metal, some of them of special interest in regard to form and character, and, among the limited amount of textile fabrics to be seen are one or two specimens of remarkable beauty of design and execution. The catalogue is prefaced by a short analytical essay from the pen of Mr. Henry Wallis. We shall return to the subject, and consider the collection more in detail, the crowded state of our columns precluding any lengthened notice of it this week. Among the contributors to the collection are Sir Frederick Leighton, Mr. Holman Hunt, Mr. William Morris, Mr. G. Aitchison, Mr. Ionides, Mr. Louis Huth, and a good many other members of the club.

THE COMMONPLACE OF ARCHITECTURE.*

THE subject I have chosen for my lecture is certainly not the most attractive that could have been selected, and even seems to require some apology, for commonplace at first sight does not promise to be interesting. Lectures on architectural subjects generally deal with the grander side of architecture and its higher branches,—with buildings on a large scale, with the use of costly materials, or with sculptured and other adornments in stone, marble, wood, glass, or metal; and, as a rule, it is very proper that it should be so. When a subject has to be mastered we naturally attack first that side which seems to present it to us in its fullest development and in greatest perfection. If we want to study the poetry of our own or another language we naturally read first the great and not the minor poets. By studying the great masters, who are the recognised authorities, we very reasonably suppose we shall obtain a true idea of the nature and the scope of the national poetical style much more readily than if we began at the other end with the ballads and popular literature, or even the second-rate poets. And in the same way with painting; one naturally studies the work of the great masters in each school first, and leaves for future and supplementary study that of their followers or less conspicuous companions. It is, therefore, very proper for architectural students to acquaint themselves first with what may be called the monumental architecture,—that of the great public monuments of the art in their own country and abroad, and to learn from them what architecture is at its best; for it is in them that they may expect to find it at its best, not only because those buildings are larger and more splendid than others, but because, being more important, it is natural to suppose that the most skilled workmen of the day were called to work upon them, and that they are, consequently, the fruit of the ripest experience of their style and age.

And yet while we study our art in cathedrals and minsters, palaces, and public buildings, it is obvious that very few indeed among us can expect an opportunity of erecting great architectural monuments of this kind; and while we study in museums the more delicate and exquisite triumphs of the minor plastic arts with which an architect has to acquaint himself, goldsmith's or silversmith's work, enamels, inlays, and the finer work of the chisel, or of the modeller in bronze, it is possible that we may very rarely have to make any direct use of our studies by designing or directing work of this elaborate and expensive nature. The knowledge of ecclesiastical architecture which we have acquired in the fanes of Rome, Vienna, or Amiens, or those of York, Ripon, and Beverley, or among the ruins of Fountains, Rivaulx, and Byland, may never be called upon for more than a modest village church; and our knowledge of civil or domestic architecture gathered from the stately piles of Rome and Florence, or on the banks of the Grand Canal, or nearer home at Kirby, Knole, Audley End, Hampton Court, and Burleigh, or in the academic halls of our ancient universities, may never find an outlet more important than some suburban villa or small country parsonage.

There seems at first sight to be an irony in this disproportion between our studies and our performances, a disproportion to be found perhaps in all professions to some extent, but more strongly accentuated in ours than in most others. And yet it is in reality a natural and inevitable state of things. Architecture must be studied as a whole or we shall never understand the separate parts of the subject; our village churches will be ill-designed unless we have studied our art in the minster as well as in humbler buildings more on the scale of our own, and we shall have small success in designing our small country-houses unless we know what can be done and has been done on a more important scale by the great masters of our art.

I would, therefore, say to the architectural student,—continue to study architecture as a whole; as an art applicable to great works and small; and to prepare yourself for whatever fortune may throw in your way. For if the high prizes and the splendid opportunities that fall only to the few should never fall to your share, knowledge and mastery of your art will be as useful to you in your own simpler work as if you had had the widest scope for its employment, and this knowledge and mastery is only to be had by the study of all that architecture has done and can do.

The student, therefore, need not be disappointed entirely, nor think his training thrown away if he finds himself confined to a less ambitious class of work than he had hoped for, and pictured to himself as entering into his future career. Like every other pursuit, architecture has its "commonplace"; and one object I have in view to-night is to point out the great importance of its commonplace side. There was no doubt a time when architecture was thought to be a luxury which only the wealthy few could command; but that time has happily passed away, and we have begun to recognise it as an art that may be applied to small things as well as great, and one whose function it is to make life pleasanter to the many as well as to the few. And as the lives of most people are necessarily commonplace, for otherwise there would be no meaning in the word, so the character of their homes to be consistent should be commonplace also; and unless architecture can adapt itself to commonplace requirements and commonplace circumstances it fails to be a popular art, and to nineteen people out of twenty it will be of no use at all.

What is it that ordinary men and women have a right to expect architecture to do for them? Its proper function is to take up the work where the art of building stops, and to provide us with houses that are not only well built and wholesome, but attractive and pleasant to live in; with churches that are not merely large enough to hold the congregation, but also decorous and solemn; with halls and places of public assembly, that besides being convenient and airy have an appearance and a dignity befitting their purpose. As long as we have eyesight and sense to distinguish one form and one colour from another we shall never think it enough that our house is substantially built, conveniently planned, well drained, and properly ventilated; all these conditions come at the beginning, they belong to the art of building, and lie outside the province of architecture entirely; they are matters of course, without which we should not be content to live in the house at all. We want something more than this: our home must be pleasing to the eye; its outline must be well imagined, its doors and windows well proportioned, its colouring harmonious, and such decorative features as we are able to afford ourselves must be artistically designed, however simple and unpretending they may be. We want pretty wall-papers, harmonious draperies and carpets, and characteristic furniture; above all, we like our house to have some individuality of character, like ourselves, who are not quite of the same pattern as other people.

All these are really very commonplace demands, and are really within every one's reach, be his means as small as you please, provided he goes to work in the right way to get it. And yet there is, perhaps, nothing more difficult to find than a successful piece of architecture of this commonplace kind, because, as a rule, men do not go to work in the right way to achieve success within these restricted limits. On the contrary, they generally refuse to be bound by these limits, and seem to think that a house which satisfies these modest requirements does not come within the province of architecture at all, unless they add something to give it an architectural character. It is, as a general rule, precisely this addition which is the ruin of it. The requirements above named make very little demand upon positive architectural details; they afford scarcely any opportunity for them; they are even inconsistent with their presence, and if we insist on dragging them in, they destroy the appropriateness of the building to its circumstances. This is the secret of the execrable design of most of the houses built for professional or commercial men that are springing up in and near our great towns. I do not know whether Leeds is an exception to the rule, but unless it is very superior in taste to London and other English towns, your own experience will tell you that it is impossible to take a walk in the suburbs without having your eyes shocked and your temper ruffled by the vulgar architectural pretence of nearly every other house you see. The provoking thing about it is that the very persons who live in these houses from choice, or are forced to live there from necessity, do, in theory at all events, profess to admire, and in great measure honestly do admire, simplicity. What is the ideal country home that the citizen delights to picture to himself in imagination, whither he thinks he should like to retire and spend the autumn of his days? Some gray farm-house of lichen-covered stone or mellowed brick that he has seen in his holidays, some larger cottage than usual with high tiled roof, dormer windows, and rustic porch, approached by a straight walk between flower-beds and clipped hedges. In imagination, at all events, he longs for rustic simplicity. His ideal is unpretending and homely enough, and there is no reason in the world why he should not realise it if, as I have said, he goes to work in the proper way. And how does he realise his dream? or rather, how does his architect or builder, or both together, realise it for him? No simple cottage or farm-house for them. They run up miniature turrets, containing inaccessible rooms, and covered with high steeple-crowned roofs; they round off their corners or disguise them with bay windows placed in an absurd manner obliquely across the angle of the buildings, strange excrescences that fritter away money, weaken the construction, and add nothing whatever to the commodiousness of the rooms. They crown the roof with ridiculous or useless balustrades surrounding lead flats, on which no sensible person would ever think of setting foot. They flank the little doorway with officious columns and carved capitals that seem put there to call your attention to the fact that there is an arch to be carried. The walls are bedecked with cheap terra-cotta ornaments, the gables armed with finials or bristling with spikes, the balconies and railings furnished with showy cast-iron work. But I need not exhaust the catalogue of the various splendours or offences of villa architecture. We are all, unfortunately, only too well acquainted with them; they haunt us in our walks and drives, and meet our gaze as we turn the pages of the weekly architectural papers. There are, I suppose, people who like this kind of work, or, at all events, builders think there are such people, because otherwise our suburbs would not be so constantly disgraced by it, but I think most of those who live in such houses live there because they have to put up with what they can get, from necessity and not from choice. The citizen who dreamed of a farm-house or rural cottage, although he calls his new house a grange or a farm, or a cottage, and names it after this or that tree, plant, or flower, can hardly delude himself into the belief that he has got what he sighed for, and has in fact been somewhat hardly dealt with.

It would be easy to follow this subject from the suburbs into the crowded streets of our great towns, where ordinary shops and private houses that call for no display are loaded with unmeaning ornamentation, which, if not bad in itself, becomes bad because it is unmeaning, having no justification in the purposes or uses of the building to which it is applied.

But it is not my purpose to tire you with a diatribe against Cockney architecture, and I should be sorry to think your Association

* A lecture read before the Leeds and Yorkshire Architectural Society on March 9th, 1885, by Mr. T. G. Jackson, M.A., F.S.A.

numbered among its members any one who required to be warned against the sins of vulgarity and pretentiousness of which it is guilty. These buildings stand self-condemned in the eyes of any one whose judgment is worth having, and although it is an unhappy fact that they are designed and carried out by men who call themselves architects, there can, I willingly believe, be no reason for my occupying your time with them any further. My object is a different one. I wish to point out that these offences against good taste and propriety would not be committed if architects and the world generally recognised the principle that architecture has a commonplace side, and that it can find plenty to do in the way of making our buildings beautiful and attractive without such violent struggles to be original and picturesque.

There are, of course, men in whose eyes architecture is a matter of orders and entablatures, columns and arches, traceries and mouldings, and who cannot conceive the possibility of its existing without them; just as there have been and still are painters who think that a picture must represent some grand historical or heroic scene, or some strange natural effect, or some unusual piece of landscape, and who think ordinary scenes of every-day experience unworthy of their pencil. But we know very well what tedious dull work these painters have left us, and how little interest their ambitious canvasses possess, and we gladly turn away from their handiwork to the simple unaffected pictures of nature as we know her, in which we find not only more of human interest to satisfy us, but more truth, closer knowledge of nature, and keener artistic sensibility. For it implies a certain dulness of the imagination when it can only be aroused by violent appeals; we do not need to shout except to a deaf man; and so in art extravagant designs calculated to impress vulgar observers will offend and wound those who are less thick-skinned and more impressionable. And do not forget that many modes of architectural design that are appropriate enough to monumental buildings become extravagant when applied inappropriately to commonplace objects. Architecture is good and noble only so long as it is suitable and appropriate to the circumstances or occasion of its employment, and consequently for the commonplace of ordinary life we must have a commonplace architecture.

This is merely saying in other words that good art depends on an accurate sense of proportion: that just as a good literary style depends on the nice accommodation of words to the ideas intended to be conveyed, and to the intelligence of those to whom it is intended to convey them, so a good architectural design depends for its merit on being proportionate to the dignity and character of the building, and of those who use it and to whom it belongs. If it fails in this nothing else will suffice to redeem it. It matters not how good its details are if they are inappropriate, nor how much skill and thought has been bestowed upon them if they are misplaced.

Now, those purely architectural forms which have been developed in what, for want of a better word, I have called "monumental" buildings, are clearly disproportionate and misplaced in the dwelling-houses of ordinary people of moderate means, and, consequently, they never fail to offend. The little roofs of such houses as these require no conical or pyramidal excrescences to break their skyline, nor their narrow frontage any turrets or breaks to interrupt them. Their small windows want no traceries to block them up, nor do their puny doors require shafts with base and capital to carry their insignificant arches. All these are impertinencies and vulgar intrusions: they are like the cheap finery worn by people who wish to dress like those who are richer than they are: they make sensible persons reflect that the money they cost might have been much better spent in making the walls thicker or the timbers larger, or the rooms bigger, and that the house might have been not only much more comfortable but much more comely if it had been less showy. The old houses of a moderate size that so charm us in town and country had no need of any of these forced extravagances. Straight simple roofs, ending in plain gables, sufficed for them; their windows, if divided at all, were divided by simple mullions of a pattern which runs through a whole county or district with little or no variation; their doors were surrounded by the simplest moulding, or in the later Post-Gothic style by a plain architrave surmounted perhaps by a modest hood for shelter. Indoors the same simplicity prevails: there are plain square rooms, with no intentional irregularities of shape; a methodical arrangement of plan according to a type generally accepted for buildings of that class; there is no restless attempt to avoid the ordinary way of planning; everything is straightforward, unaffected, modest, and, in a word, commonplace.

Architecture, then, may be commonplace and yet charming. Indeed, it is a question whether the total sum of pleasure which we receive from the art does not owe more to these humbler examples than to its more splendid achievements. For it is of more direct consequence to us that the homes we live in and those of our friends whom we visit should be pleasing and in good taste, than that our neighbourhood should be adorned by a few magnificent buildings. And that they may be pleasing and in good taste it is essential that their architecture, furniture, and decoration should all be in proportion to one another, and to the scale and importance of the house itself, and to the circumstances of its building. It is difficult to define exactly the limit which divides the sphere of positive architecture from that of commonplace. Indeed, it is impossible, for exceptional cases arise which defy general rule. It certainly does not depend on considerations of size, for many very large buildings, such as warehouses and railway stations, have only commonplace uses to fulfil, and nowhere are architectural impertinences more offensive than in them. And in the case of dwelling-houses it would be absurd to say that houses of, for instance, a certain rental, may be treated in a more distinctly architectural manner than those of a lower rental,—though, of course, as a rule, houses should be simpler in proportion as they are smaller. There is, however, one large class,—indeed, the largest class,—of ordinary residences, which, from its circumstances, admits only of commonplace treatment, and never fails to be offensive unless it is treated in that way. I mean houses that are built wholesale to cover a building estate, built probably by one man, very likely from one set of plans, and at one time.

It is possible that no more difficult problem could be set to an architect than the successful achievement of a large building scheme of this kind. If anything were wanting to prove this we have only to use our eyes to see what deplorable failures, from an artistic point of view, most such schemes result in. To say nothing of those cases, the most numerous of all, where the houses are designed by persons who know nothing of architecture and who would not succeed in any kind of building, the result is often very little better where an architect is employed whose work elsewhere we have had reason to admire and respect. The speculative builder asks for a design for a single house which is to be made use of over and over again some twenty or thirty or even a hundred times in the roads or streets which he has laid out. In his ignorance he supposes that if he gets a good design from a good architect his estate will be covered with well-designed houses; and so it might be if the architect had a chance of designing all the houses, but in fact he designs only one. Grant that he makes this design the best he can, and that if only this one house were built it would be an excellent piece of architecture, still the mere repetition of it so many times in close proximity is fatal. The better it would be if it stood alone, the worse it is if only one of a series, and this may be taken as an absolute rule and a very proper test for this kind of building.

In designing a single house, which is to stand among others by different hands, or, perhaps, quite alone, and especially in building for the person who is to live there, an architect may legitimately indulge himself in original fancies, and give his house a distinctive and individual character. He will consult the habits and tastes and occupations of the owner, and, if they are in any way special, he will arrange his house on a special plan; and the architectural features, however simple, will have some sort of individual character, in consequence of being designed for a particular building, and with some knowledge of those who are to live there. It is only on these terms that domestic architecture of a really high order is attainable nowadays, and it was only under the same conditions that the delightful domestic architecture of the past was produced.

But, if a house with any individuality of design such as this is taken and multiplied twenty-fold, thirty-fold, or a hundred-fold, the special features become meaningless, the original fancies cease to be original and become tedious, and the design, which pleased singly, nauseates by repetition. This seems to me the reason why building estates that are laid out and built over from the designs of really good architects are so constantly very little better than those that are built over by very inferior men of no pretensions to architectural skill. The design is made as if for a single house, and might, possibly, have been very successful in the case of a single house, and for that very reason it is ruined by repetition over a large area.

Now, it is of no use decrying the system of wholesale speculative building: it is the order of the day, and one of the necessities of our age, I suppose, which cannot be dispensed with. The people who can find the ready money required for building a house for themselves are very few compared to those who can find the means to pay a high annual rental, and it is, perhaps, impossible to build a single house at as cheap a rate as several at once. We must accept the system of speculative builders, building leases, wholesale use of designs, and all the concomitants of this extremely artificial mode of providing houses for the many, and we must try to make the best of it.

Now, do what we may, the conditions are commonplace enough, and that is the very first thing to be recognised if we are to succeed in making anything tolerable of such building as this. And if fitness, or exact correspondence with the conditions and circumstances of the occasion, is the mainspring of all good architecture, the style of such buildings must be simple and commonplace. It can hardly be too plain and too free from individuality of design. Only the simplest architectural features, and such as are most obviously connected with the construction, can on any account be allowed, and even of them the fewer there are the better. No caprices or fancies of ornament must be attempted, because, however good they may be singly, they pall by repetition; no quaintness nor picturesqueness of form will be tolerable because it is like a *bon-mot*, which becomes stale if told too often.

If it is objected that the result will be monotonous and tiresome, I reply that the monotony is inevitable whatever you do. You cannot place twenty houses of the same pattern in a row without monotony whether they be plain or gorgeous, simple or fantastic; but it is certain that the monotony will be less tiresome if they are all plain than if they are all gorgeous, or all simple than all fantastic. We must boldly face the monotony of the system and reflect it in our design, and take care to make it as little tiresome as we can. The speculative builders of 100 years ago understood this much better than those of the present day. The squares and streets with which the Bedford, Portland, and Portman estates in London were covered at the end of the last century are far more suitably designed for their purpose than the modern houses in Belgravia and at South Kensington, built by people who thought they knew a great deal better. Harley-street and Gower-street are monotonous if you like, but they are not more monotonous than Grosvenor-gardens or the other "terraces," "gates," and "squares" that have sprung up during the last twenty years to the north, east, and south of Hyde Park or Kensington Gardens; for if the former is a monotony of brown brick, the latter is a more tedious monotony of polished granite columns, stucco finery, and cast-iron trumpery. It is surely far worse to be loud than to be silent, and far better to be dull than to be vulgar.

This wholesale method of building, then, offers no legitimate sphere for positive architectural design, which would only invite attention to its monotony and emphasise its commonplace character. But it does not follow that an architect is altogether debarred from doing a great deal to make houses of this kind interesting and, even in a minor degree, beautiful. It is true he must give up the idea of any strong architectural effect, or any pronounced architectural character in the exterior, and confine himself to a rather neutral and restrained method of design, though even here he can study the proportion of his doors and windows, the levels of his string-courses and parapets,

and the vertical and lateral divisions of his elevations, so as to ensure agreeable proportions of part to part; and he can study carefully the few ornamental features for which there is occasion,—the doorway, the ironwork, the balcony, the chimney-caps,—so that they shall all be graceful and pleasing without being obtrusive, and while one and all thoroughly well designed, still so abstract and neutral as to bear repetition without becoming tiresome. But once indoors an architect has no lack of opportunity, even in these commonplace houses, of showing his skill. The other ninety-nine houses are now out of view, and he may employ more positive forms of design without fear.

The last-century houses in London to which I have referred teach a very useful lesson in interior decoration with simple means, and contrast very favourably with their modern-built rivals. Externally they are simple enough,—mere fronts of honest brown brick with rectangular windows and round arched doors. But both windows and doors are evidently proportioned on some accepted canon, and have that "right" look about them that shows they have been thought of by the arcbitect, and not left to mere haphazard, and the whim of the builder's forman. The ironwork of the glazed fanlight over the door, and of the balconies on the first floor, is simple and conventional, and does not call for much notice, but when you do happen to notice it you find it, within its own modest sphere, almost perfect in grace of line and excellence of workmanship. In the interior, if it has escaped the barbarisms of modern decorators, and preserved its original fittings, as is the case with a house on the Portland estate, which it is my fortune to live in, you will find fireplaces with pretty Italian marble chimney-pieces in the best rooms, delicately reeded, and with delightful little plaques carved with Classical subjects and little rosettes, or inlaid with thin veneers of coloured breccia; simpler fireplaces in other rooms, with mantelpieces of wood enriched with festoons and wreaths, moulded in a composition of whiting and glue, all varied in the different rooms, though, of course, used over and over again in the several houses; architraves and cornices over the doors of the best rooms, executed in the same way with little vases, rosettes, and swags of foliage; and doors to the principal rooms of beautiful rich mahogany. Living, as I do, in one of these houses, and by no means a large or important one, I can testify to the constant pleasure to be derived from the little evidences of thought and refined judgment observable in almost every detail. These houses were built, either by the Brothers Adam, who were engaged on this estate, or by followers of theirs, who imitated their manner, and prove conclusively that wholesale speculative building is by no means necessarily productive of uninteresting houses, if only it be done by men with true artistic sense of proportion, who are content to efface themselves so far as any bold architectural elevation is concerned, and to build in a commonplace way to suit commonplace requirements, without, however, neglecting to make every detail within the narrow limits they have imposed on themselves graceful, appropriate, and pleasing.

Contrast with these the showy productions of the modern speculator in house property. Everything is reversed. Outside are pretentious ornaments that no one notices because they are monotonously repeated from house to house, while inside everything is starved just where one would value some attention to detail; or, if there is any ornamentation at all, it is of a careless, coarse kind, that disgusts one and impels one to remove it if possible. The very mouldings round the door-panels are enough to drive one out of the house, especially when one recollects the delicate details of the architraves and doors in the older houses I have just described.

Although, therefore, the interior architecture of ordinary dwelling-houses of this class must be confined within narrow limits, there is abundant room left for its free exercise. It is wonderful what may be done to make an ordinary room attractive or the reverse by very small differences of design. Let any one who has to build a plain house of little architectural pretension try what he can do by simply drawing out to a large scale, say of an inch or even half an inch to a foot, the four walls of the principal rooms, with their windows, doors, chimney-pieces, bookcases, and cupboards in their proper relative places, and the skirting and cornices round the walls, and if he has never tried it, and, I believe, it is very seldom tried in practice, he will be surprised to find how many ideas will suggest themselves to him by way of improvement, and with what very slight alterations of proportion and arrangement, and at what very small expense he may raise the character of the room from that of a mere chamber of accidents to the dignity of an architectural composition.

The same considerations that govern the architecture of a commonplace residence should govern the interior decoration. Here, too, everything in order to be appropriate and in proportion should be somewhat commonplace. Elaborate decorations, whether of architecture painting or sculpture, are suitable only for public buildings, churches, or palaces, and are not only thrown away, but positively offensive in the rooms we live in. Even in palaces and noblemen's houses it will be found that the great halls and galleries, with sumptuous decorations and splendid furniture, are kept for show and occasions of state, while the family live habitually in smaller rooms furnished much more simply and unpretendingly.

And so in ordinary houses of a smaller kind, any decoration of an ambitious or striking and unusual kind is misplaced, out of key, and disagreeable. How true this is may be seen every day, especially in the houses of those people who pretend to taste and are afflicted with the fashionable æsthetic craze. They think that they cannot go wrong if they cover their walls with Mr. Morris's papers, of which they generally choose the most pronounced designs, and hang their little rooms with a paper that would suit one of four times the size. They hold that there is safety in sad greens and virtue in dark and dirty colours, and they use these with the most dismal effect in rooms that with simple treatment might be made cheerful and light. One is haunted in these houses by the shadow of art. There are "art colours" advertised nowadays, as if art lay in certain colours, and not in the skilful use of any and all colours whatever; there is "art furniture," as if any good furniture whatever could be made except by the aid of art. By "art" nowadays is understood not the making of these things well and beautifully, but the putting in of plenty of little turned balusters and painting them of a dingy colour. Of all the furniture that has ever been made, even in the most Philistine time of the nineteenth century, nothing has been turned out so bad as the chairs, tables, sideboards, and chimney-pieces that fill the pages of the illustrated catalogues of the "art shops" of the present day. They show no skill in workmanship, no refinement of execution, no grace of line, no beauty in the mouldings, no delicate touches of carving; but in place of these are unstudied outlines, crude forms unmeaningly heaped together, coarse brackets, and unworkmanlike finish, which, it is hoped, may be carried off by a little cheap turnery and some vulgar scrolls or leaves, not even carved, but coarsely incised in the surface of the wood.

But it is not only because or when the details are bad that such a room is an offence to an artist; it offends because the whole scheme of decoration is disproportioned to the scale of the house and the commonplace uses of the room. Rooms in small houses are not wanted for show, but for use, and an æsthetic drawing-room which is set out as if for the stage of a theatrical entertainment is not a place in which ordinary human beings can live at their ease. However powerful an impression it may make upon the casual caller, it is not a place to be lived in and used, and that ought to be the first consideration in furnishing and decorating a living-room.

This suggests what I venture to propose to you as a useful maxim, applicable not only to the humbler kinds of architecture of which I have been speaking mainly to-night, but to the art in all its branches, high and low. It is this; that *those things with which we are constantly in contact, and which we are constantly using, should be of a neutral or commonplace character.* If they are not of this character they are sure to be tiresome, fatiguing, and, in the end, disgusting. One does not want to be always examining the chairs we sit on, the papers on the walls of the rooms we live in, the implements we are always handling, the furniture by which we are constantly surrounded; and if they are all designed in such a style that they make constant demands upon our attention, and are always clamouring for notice, they are sure to end by boring and disgusting us. In proportion as things are common they should be quiet and unobtrusive. This is not inconsistent with their being in their own way beautiful and worth examining. On the contrary, I would have every detail in the house carefully designed and fit to bear examination: the mouldings on the doors, the sections of the architraves and linings, the chimney-pieces, stairs, balusters, and the hundred other little members of the design of the building should all be studied carefully and well-proportioned: and though nothing should be needlessly obtrusive, everything should show care and thought when looked at closely. So with the furniture and decoration. The colouring should be quiet and harmonious, and the designs simple and restrained, and above all proportionate in scale to the modest size of the apartments. The furniture should be simple and graceful, without being fanciful or ostentatious. Our aim should be that the room should be thoroughly usable in the first place; a drawing-room where there is no table on which we can find room for a book, or where we can sit down and write a letter, is a misery and bad art; and in the next place it should be beautiful with that beauty which arises from fitness, from good proportion, from careful though unobtrusive design, and from tender harmonies in quiet keys.

A successful design on these modest principles is quite difficult enough to satisfy the most ardent student of architecture. It demands much more knowledge, much keener artistic sensibility, much higher powers of design than many more important phases of our art. When I commend you to study the commonplace side of architecture, and to confine yourselves to that unless you have a special call to rise above commonplace to grander subjects, I do not ask you to give up art, or to sink to a lower grade as artists, but simply to study the proper mode of dealing with one class of subjects rather than another. To tread among architects the path that Jane Austen marked out among novelists is surely a sufficiently high standard for the boldest aspirants amongst us. It is no doubt a more splendid thing to build cathedrals and public buildings, palaces and mansions, than parsonages and village churches or small houses, just as "Rob Roy" or the "Antiquary" may be considered grander achievements than "Emma" or "Persuasion," but there is surely not less art required for success in one field than another. To make a commonplace story interesting, and even exciting, as Miss Austen has done, in which the incidents never rise above the importance of a pic-nic or a dinner-party, and to keep us in breathless suspense to know whether Catherine Morland goes for a drive with John Thorpe or for a walk with Henry Tilney and his sister, requires consummate skill and supreme art which any one might be proud to approach. And, just as Sir Walter Scott admitted, that, though he could do "the big bow-wow" well enough, this young lady was his superior in depicting ordinary daily life, so may it be that many a celebrated architect, who has earned fame by large national works, may fail to succeed when commonplace architecture only is required so well as many a less distinguished man who works truthfully and modestly within the narrower limits to which common sense and good taste confine him.

As to the value to the world of good, simple, and inexpensive house architecture, it would be superfluous for me to say much. These are the houses in which most of us live, and we have most of us in our time suffered from the ugliness and shortcomings which generally distinguish them. It is not enough that the general standard of architecture should be raised so far as concerns our great national monuments, if we are condemned at our own homes to live in the midst of work that is both coarse and careless, and also extravagant and pretentious. We want the improvement to extend to our own roof, and it touches us more nearly that our homes should be made pleasant and beautiful, and our daily life sweetened by association with comely and appropriate surroundings, than that our streets should be filled by splendid buildings of greater public consequence. There is a noble field open for architects in this direction, and an appreciative public waiting gratefully to welcome and applaud their efforts.

I do not overlook what has been done in the last few years towards introducing a more

simple and unpretending style of domestic architecture, in which what is struck out in the way of positive ornamentation is more than made up by careful and thoughtful design of simple details. The school of what is very inappropriately called the "Queen Anne Style" began in the recognition of the quiet, homely grace of some Post-Gothic buildings, and it studied to work on the same modest principles. But no sooner did this style become fashionable and enter into the æsthetic cant of the day, than it began to grow as extravagant and pretentious as its predecessors, and now you may see more offensive work of this kind than, perhaps, any other. Whole fronts are overloaded with carved brickwork or terra cotta, broken pediments, pilasters, consoles, and balusters, in vulgar profusion, that go far to make the name of the good queen a by-word. It is curious that a mode of building which began by renouncing positive architecture should have thus run to seed in the hands of ignorant followers of the style, and should now exceed all others in impertinent extravagance.

I have confined my remarks to-night principally to ordinary domestic architecture, because the conditions and requirements of that branch are essentially commonplace to a greater degree than those of other buildings. But every architectural design, on however grand and splendid a scale, has its commonplace parts, which require to be treated in a commonplace way. It would be interesting to trace the mischief that has resulted to ecclesiastical and civil architecture from the neglect of this principle, but this would open a much larger field of inquiry than we can to-night enter upon, for it is already time that I should bring my lecture to an end.

The main point which I have tried to convey to you this evening is the necessity of cultivating a proper sense of proportion,—of taking care that the design shall be properly proportioned to the subject and the occasion. As an instance of disproportion or inconsistency, I have enlarged on the way in which the designs of ordinary dwelling-houses are constantly overdone with attempts at architecture for which they have no occasion. Such houses do not want extraordinary architectural display; they cannot carry it, and, in point of fact, the fewer actual architectural features they have the better for them. I have also pointed out the need of architects who will work on these humble and self-denying lines, and give us buildings well designed without being pretentious, and quiet without being insipid. That some self-denial will be required must be admitted. To younger men especially, freshly primed with their architectural studies of the past the temptation is, no doubt, strong to seize the opportunity which is at the beginning of our career so sadly infrequent, to realise some of the magnificent ideas that fill their imagination, even when there is no magnificent occasion for their realisation. It is no doubt hard not to be able to let off a little of their store of knowledge and ideas, but, hard as it is, the lesson must be learned that architecture misplaced is worse than wasted, and that design that is disproportionate to the subject is worse than thrown away. The old Latin poet warns those who would be poets not to write comedy in tragic verse, and tells them that if their characters talk in language disproportioned to their fortunes they will only make the audience laugh. And so it is with architecture: we must take care that our little fishes do not talk like great whales, or our work will only be ridiculous; and those who have only commonplace work to do must be contented to wait for more important occasions before launching out into architectural magnificence. Meanwhile, I have endeavoured to show that quite as much art is required in the simple restrained work which is alone under these circumstances admissible, as in work which is more distinctly architectural. Those to whose lot the more important buildings of their age do not fall, and whose life may be passed in work of a less conspicuous kind, will find plenty to interest them, abundant room for the display of considerable artistic gifts, and ample occasion for earning the gratitude of a public which has suffered too long from the vulgarity and impertinence of most modern domestic architecture.

Erratum.—In the letter on "The Stone used at Westminster Abbey" (p. 398, *ante*), read "sandstone" instead of "limestone" in the last line but four.

THE BUILDING TRADES' EXHIBITION AT ISLINGTON.

THE sixth annual Building Trades' Exhibition in the Agricultural Hall, Islington, was opened on Monday morning, although, as usual, a large number of the exhibits were not ready until Tuesday and Wednesday. In extent, the exhibition falls somewhat short of some of its five predecessors, and is hardly so varied in character as one or two previous displays we have seen. Novelties appear to be very sparsely distributed amongst the large mass of well-known materials and appliances. We are more than ever convinced that, for all practical purposes of comparison as to progress in details of construction, these exhibitions recur much too frequently. If held at longer intervals (say from three to five years) we think they could not fail to be much more useful and instructive than is the case under present conditions.

One of the strongest and best-represented sections of the exhibits is that comprising natural and artificial stones, concrete, brickwork, terra-cotta, &c.; and among the most prominent of the exhibitors in this section are Messrs. W. H. Lascelles & Co., who have quitted their accustomed place under the North Gallery and have come out into the centre of the hall, where a somewhat ambitious structure in their red concrete has been built up. It consists of a lofty porch supported by columns with Ionic capitals, with balustrading atop, and finials or terminals at each end. This porch and a bay window are from the designs of Mr. Bassett Keeling, and are intended for Victoria Mansions, Westminster. Messrs. Bacon & Co., Finchley-road, have a creditable display of pottery, terra-cotta, and brickwork. Hall's Patent Hanging Tiles (shown at Stand 121) are intended for facing old or new walls in courts, areas, and corridors. Some extra light is gained, and the tiles are secured by nails being driven into the joints of the brickwork. Curzon's "Impervious" Concrete Company (Stand 162), exhibit some paving concrete, laid *in situ* and in slabs. These exhibitors show also patent slate bricks for engineering purposes. Mr. James Brown, of Broad-street, E.C., has a display of moulded and ornamental bricks, but there is very little in novelty on the part of old or new exhibitors in this department, although the goods are apparently well selected. G. Middleton Edwards, of Gresham-street (Stand 195), presents dovetailed corrugated iron sheets (Hyatt's patent), to be used in combination with Portland cement concrete in the construction of fireproof flooring and walls. It is suggested that by the use of these corrugated plates attached to timber quartering and covered with plaster, fireproof and weather-proof external walls could be constructed. This mode of construction would appear to be well adapted for the colonies and for districts subject to earthquakes. At the same stand, Edwards's patent metal laths are put forward as an acquisition in constructing fire-resisting ceilings. Wilkes's Metallic Flooring and Eureka Concrete Company (Stand 210) present an ambitious display in the form of a portico built up. The columns are of red concrete, but hollow. The shafts are surmounted by enriched capitals and frieze, and entablature to harmonise. This firm has also in connexion a temporary structure to illustrate different samples of fibrous and fireproof plastering. Messrs. McLean & Co., of Cannon-street and Newark (Stand 228) submit some samples of their cement, and specimens of mouldings made therewith, together with samples of plaster of Paris and Portland cement. Messrs. Thomas Lawrence & Son, of Bracknell, Berks, have a noteworthy exhibit in the form of a profusely carved red brick porch or doorway, with oak door, the whole of the work having being executed by Messrs. W. Cubitt & Co. The workmanship is exceedingly creditable, though much of it is wofully misapplied, for we hold it to be a great mistake to carve, especially with such elaboration as is here shown, a material so unfitted for such treatment as brick. Mr. George Wright, of the East Acton Brickworks (Stand 166) shows a somewhat attractive structure erected for the purpose of showing the adaptation of moulded bricks for ornamental purposes. More than one of these brick structures in the exhibition is overloaded with ornament, and the fantasies and freaks of the so-called "Queen Anne" work are altogether eclipsed with the surfeit of figures and heraldic and other devices that are pressed into service, to the astonishment of the beholder. Messrs. F. Rosher & Co., Blackfriars (North Side, 331), present, as usual, an excellent display of varied goods. Mr. J. Matthews, Royal Pottery, Weston-super-Mare (Bay 24) exhibits Poole's well-known patent bonding square-cornered roofing tiles, very extensively used at present. The Woolpit Brick and Tile Company (Bay 23) have on view special dark red facing bricks, white ditto, and machine-made and hand-pressed white bricks, all well turned out. Webb's Worcester Tileries Company (Stand 181) exhibit a good assortment of geometrical mosaics and encaustic tiles for floors, and printed tiles for walls, ceilings, borders, furniture, &c. White's Hygienic Rock Building Composition for securing strong and impervious walls is shown at Stand 332, North side, under tests which demonstrate its efficacy. The Dunton Green Brick and Tile Company have on view some good specimens of red and white facing and moulded bricks, roofing-tiles, &c. Messrs. Maw & Co., of the Benthall Works, Jackfield, near Ironbridge (Stand 136), are exhibitors of decorative majolica and mosaic work arranged as for a reredos, and of encaustic and other tiles. Hitchins's Fireproof Plastering Company have erected a structure under the east gallery of the hall, to show the applications of their material.

The exhibitors of natural building stones were almost entirely absent from their allotted stands in the beginning of the week, although several well-known firms were announced in the catalogue. Messrs. Trickett & Sons, of Millwall, as in former years, show some good specimens of rough-hewn and squared building stone of various descriptions. Messrs. Pictor & Son, of Box, Wilts (Stand 23), show specimens of Bath stone, Box Ground stone, Stoke Ground and Corsham Down stone, and stones from Farleigh Down and other well-known quarries. An artificial material having all the appearance of a hard natural stone, and designated "Croft Adamant" is exhibited by the Croft Granite, Brick, and Concrete Company, of Croft, near Leicester. A structure with traceried windows of various styles is raised *in situ* to illustrate the capabilities of the material. Windows are shown in the four sides of the building of as many different styles in the tracery composing them. The material takes an excellent finish, and the walling of the different sides of the structure is varied from squared rubble to irregular pointing.

In the department of prepared house-joinery there are sundry specimens of skilled workmanship, worthy of notice and commendation. There is also a varied assortment of imported Swedish joinery, which is sold now at prices that would have been paid a few years ago to the joiner for labour only. Most of this imported work is well seasoned. Messrs. W H. Lascelles & Co., in addition to their concrete exhibits, employ some creditable and neatly-finished joiners' work. Among these is an excellent pine chimney-piece with over-mantel, from a design by Messrs. Ernest George & Peto. In high-class joinery in connexion with staircase and handrail construction, Mr. S. Ransom exhibits some admirable specimens in oak, walnut, mahogany, pitch-pine, &c. The joinery exhibits of Messrs. Thomas Andrews & Son, of East Molesey Mill, Hampton Court (Stand 71) are exceedingly good. Mr. S. Putney, of Baltic Wharf, Harrow-road (Stand 165), exhibits a novelty in what he calls Patent "Pavodilos" solid wood flooring, floor-borders, panels, dados, and V-jointed boards. The tongueing or interlocking adopted in this system of jointing, which has already been noticed by us, is very ingenious, and withal simple. By means of this method of jointing a really good floor is obtained at a comparatively small cost. We recommend visitors to inspect Mr. Putney's exhibits. Messrs. Esdaile & Co., City Saw Mills, Wenlock Basin (Stand 208) have on view a varied collection of general joinery work, including English, American, and Swedish goods. Messrs. W. & R. Crow (Bays 57, 58, 59, Arcade) display a very large assortment of joinery work. Messrs. M. C. Duffy & Son, of Bermondsey (Stand 24), are exhibitors of a plentiful variety of balusters, newels, and general turnery,—good and cheap. Mr. J. F. Ebner, of Clerkenwell-road (Bay 21), has an excellent display of his well-known Hungarian parquetry and his hydrofuge parquet. This latter is capable of making a very good fire-resisting and impermeable floor, and is well worth the attention of architects. Mr. Ebner also shows some very elaborately-carved

dadoes, executed in Belgium, and some good chimney-pieces and over-mantels, besides a variety of mosaic panels, most of which are very creditable in design and execution. Messrs. Scheibler Bros. & Co. (Stand 83) are exhibitors of some good parquetry.

There is but a scant display in wood-working machinery. Messrs. F.W. Reynolds & Co. (North side, 327-8) make a very fair display of mortising, planing, tenoning, and thicknessing machines, but they were not in full operation on the day of our visit. Machines are shown suited for hand-power in small workshops and for steam-power. Messrs. M. Powis Bale & Co. present some planing and thicknessing machines, but these being scarcely in position on the occasion of our visit, we cannot venture on a description. Some other machines for purposes connected with building are shown; for instance, Mr. W. Johnson, of Leeds, exhibits brick-making and pressing machines, which are worthy of the notice of brickmakers, sewer contractors, and general builders. Messrs. Lewis & Lewis (South side, 309), of Cambridge Heath, London, aim at great efficiency and economy with their high-speed steam mortising machine. They also show band-sawing machines, boring machines, and contractor's portable steam engine with latest improvements. Messrs. Sagar & Co., Halifax (South side, 303), exhibit a good power feed planing and thicknessing machine. This is used for taking stuff out of what is technically called "twist," surfacing, and straight or taper work. Mr. E. S. Hindley, of Queen Victoria-street and Bourton, Dorset (North Side, 321), besides his well-known horizontal and vertical engines, shows a circular and band-saw bench for hand-power, complete, with rising and falling spindles. This is a very compact machine, with its boring-table, band-saw adjustible fence, and fast and loose pulleys for hand or steam power, as may be required. Messrs. E. P. Bastin & Co., of West Drayton, are exhibitors of machinery and appliances needed for use in the brickfield. Mr. E. Houghton Brown, of Ball's Pond (South Side, 296), shows some useful plant and machinery for builders' use. Messrs. Burney & Co., of Millwall (Stand 2), are exhibitors of wrought-iron cisterns and tanks of varied forms and capacities.

Of the decorative exhibits, the Lincrusta and General Decorating Company's stand, and that of Messrs. Woollams & Co., are among the most prominent. The last-named exhibitors have, as usual, a very excellent display of admirably-designed wall-papers, which have the additional merit of being coloured entirely without the aid of arsenical pigments. Messrs. George Jackson & Sons, of Rathbone-place (Stand 164) have on view some good specimens of ceilings, cornices, friezes, columns, &c., in fibrous plaster. The Indestructible Paint Company (Stand 209), and the Electric Paint Removing Company (Stand 158) exhibit their specialities.

The St. Pancras Ironworks Company (Stand 123) are exhibitors of their stable-fittings, cow-house and piggery fittings, iron staircases, and some specimens of ornamental wrought-iron.

Stoves and grates are well represented by Messrs. George Wright & Co., of Queen Victoria-street (Bay 19), who exhibit slow-combustion and other stoves in combination with marble and wood chimney-pieces, tiled hearths, &c. Their louvred fire-bars, to which we have previously called attention, should be seen by visitors. Messrs. Yates, Haywood, & Co., at the eastern end of the hall, are large exhibitors in the same department of industry. Mr. Harry Hunt (Bay 8) shows the Hygiene Ventilating Hall Stove and the Crown Jewel Stove. In connexion with stoves, we may mention the heating-apparatus shown by Mr. Renton Gibbs, of Liverpool (Stand 198), and Messrs. Messenger & Co. (Bay 13), who show their "Loughborough" boiler in conjunction with a span-roof conservatory constructed on their system. Of locks, lock furniture, electric bells, and builders' ironmongery generally, there is a varied display. Messrs. Archibald Smith & Stevens (Stand 76) exhibit Stevens & Major's patent hydraulic door spring and check, and Russell's patent "Binate" Locks and Furniture. Messrs. Broughton & Co. (Stand 252) show their "Chelsea" centre-bit mortise locks, of which we spoke in detail a short time ago. Messrs. Chambers, Monnery, & Co., of Bishopsgate-street (Bays 55 and 56 of Arcade), exhibit cottage ranges and kitcheners, as well as their patent wall-ties. Messrs. W. & R. Leggott, of Bradford (Stand 11), show their handy and easily-worked appliances for opening and closing fanlights, skylights, &c. Messrs. Meakin & Co., of 84, Baker-street (Stand 170), exhibit their sash fastener and opener and their solid-frame oilable sash-pulleys. Messrs. Smith & Turner, of Bartholomew-close (Stand 33), exhibit their specialities in the way of door-springs and hinges and water-bars for French casements. Mr. Alfred Gill (Stand 192) shows some patent lock furniture, which is very simple, and appears to be likely to prove effective. Messrs. C. D. Douglas & Co., of Queenhithe (Stand 81), are also exhibitors of lock furniture. Electric bells are shown by Mr. Julius Sax, of Great Russell-street (Stand 122A). Messrs. Eck, Callow, & Co., are exhibitors in the same department.

Among other exhibits, Messrs. Attwood & Co. (late Salmon, Barnes, & Co.) show their patent revolving shutters and school divisions, as well as a model of an expanding grille for a shop-front in lieu of shutters. Mr. Thaddeus Hyatt, of Farringdon-street, E.C. (Stand 161), shows varied display of his prismatic pavement lights and lights of various forms for the purpose of illuminating basements and areas. Messrs. Clark, Bunnett, & Co., Limited (Stand 13), show their revolving shutters, metallic Venetian blinds, some good constructional ironwork, and a capital self-sustaining lift. Mr. J. Stannah (Stand 200), exhibits a very good 5 cwt.-power lift, with iron-framed cradle and iron guides; this lift, which is worked by a small gas-engine, is provided with an effective safety apparatus. Messrs. Hayward Brothers & Eckstein (Stand 126) exhibit their admirable semi-prism pavement-lights, the merits of which are too well known to render their enumeration necessary here. Their self-locking coal-plates appear to meet the end in view in a very effectual manner. The same firm are exhibitors of Hayward's Sheringham inlet ventilators and Boyle's mica outlets. Other exhibitors of ventilators are Messrs. Ewart & Son, of Euston-road (who occupy Bay 3 and the centre of the Hall and show some ornamental zincwork), and Messrs. Robert Boyle & Son (of Holborn Viaduct). Mr. F. H. Smith, of Queen Victoria-street (Stand 9) exhibits his "siphonic aspirator" system of ventilation; and Messrs. C. Kite & Co., of Chalton-street (Stand 159), show their exhaust roof and chimney-breast ventilators, and other appliances, of which we have spoken in terms of commendation on previous occasions.

Exhibitors of other sanitary appliances are not very numerous, but Messrs. John Bolding & Sons, of South Molton-street (Stand 120) have a very good representative display of water-closets, bath-fittings, &c. Messrs. Brazier & Son, of Blackfriars-road, are exhibitors in the same department, as are Messrs. Capper, Son, & Co., of Fenchurch-street, who exhibit their "twin-basin" closets in a new form,—that is, adapted for use as "pedestal vase" closets, without woodwork boxing-in. Mr. F. Botting, of Baker-street, Portman-square (Bay 4) exhibits a few things which merit the attention of visitors, including Lyne's patent ventilated closet, Durrans's patent sanitary appliances, a smoke-machine (very portable and convenient) for testing drains, air-tight covers, &c. In Barstow's patent combination water-filter, shown at Stand 72, the water first passes through a natural stone, with which the upper portion of the filter is lined, and afterwards through granulated carbon or charcoal, the latter being renewable from time to time.

We have been necessarily brief in our notes, but they will be sufficient to indicate the general scope of the Exhibition, which will remain open until Saturday, the 28th inst.

The Burns Memorial in Westminster Abbey.—On the 7th inst. the Earl of Rosebery unveiled the national monumental bust of the poet Burns in the Poets' Corner of Westminster Abbey. Mr. Wilson, chairman of the Memorial Committee, said that the monumental bust had been subscribed for with the shillings and pence of the admirers of the poet in Switzerland, Bengal, New Zealand, Nova Scotia, America, England, and Ireland, and in almost every town in Scotland. The committee had selected as the artist Sir John Steell, a veteran member of the Royal Scottish Academy, who had produced no fancy likeness of the poet, but one based on the portrait of Burns by Nasmyth. The work is broad and powerful in style, and full of character: a very successful example of a monumental portrait bust.

WESTMINSTER HALL RESTORATION COMMITTEE.

At the sitting of the Committee on Friday, March 13th, Mr. H. W. Brewer was examined, and produced the drawing of "The Old Palace of Westminster," which was reproduced in the *Builder* for Nov. 15 last. He explained that the drawing was intended to convey some idea of the appearance of the buildings as they existed during the earlier portion of the reign of Henry VIII.; that the drawing had been produced after very considerable research, the examination of very numerous ancient views and documentary evidence, both published and unpublished. Mr. Brewer was strongly of opinion that the ancient palace and the abbey formed one single group of buildings, and that no thoroughfare passed between them; in fact, that the conditions were pretty much the same as one sees at Windsor, where the Collegiate Church and buildings of St. George are inclosed within the walls of the castle. That this state of things continued until the construction of St. Margaret's-street, which necessitated the demolition of no less than four ranges of ancient buildings, is proved by the following extract from Smith's Westminster:—"Hell and Paradise, two prisons of the Old Palace, were pulled down in 1793. . . . . St. Margaret's-street was made out of St. Margaret's-lane, and 34 ft. of that part of the Palace of Westminster where 'Tudor Buildings,' erected by Henry VIII., originally stood, and a portion of the old 'Fish Yard.' At the end of this lane stood the ancient brick buildings called Heaven and Purgatory. . . . . Another portion of the Tudor buildings which projected 72 ft. into St. Margaret's-street was also pulled down in 1793."

The construction of Abingdon-street necessitated the removal of other ancient buildings, and thus the Palace and the Abbey became two separate and distinct groups of buildings. Mr. Brewer pointed out that the old Palace could not, at any time, have possessed anything in the nature of a "Land front," still less could the west side of Westminster Hall have served that purpose, because there was documentary evidence which seemed to prove, beyond a doubt, that the space to the west of Westminster Hall, between it and St. Margaret's-lane, had been occupied by buildings as early as the reign of Edward III. A list of the buildings restored by Edward II. and III., derived from the existing accounts for these works, and published by Smith, mentions "The Seneschal's Chamber on the west part of the Great Hall," "The Marshal's Chamber under the Great Hall," "Staircase from the Seneschal's Chamber into the small court opposite the conduit." A conduit in the form of a leopard, within the wall under the hall, called "Stanneyn." "Butlery under the Seneschal's Chamber." "A kitchen in Pergate [Purgatory] ward." "Tower above the Marshal's Chamber." "House called 'Hölle' [Hell] under the Exchequer." "Council-room in Exchequer, 'Saltaria or Salting-house,' under the Exchequer." "Door of Hell in the Exchequer," &c.

Mr. Brewer pointed out also that there are several grants of buildings existing upon this site during the reign of Henry VII. One of these, dated Sept. 20th, 1485 (that is, within one month of Henry VII.'s accession), specifies that "Several mansions within the Palace of Westminster were by letters patent granted to Anthony Keene, esq., for his life. The parcels comprised in this grant are there stated to be 'all the mansions belonging to the king within the Palace of Westminster'; together with the custody of 'Paradise and Hell,' within (evidently close to) Westminster Hall; three tenements which Jacob Fry held and occupied; the custody of Purgatory, within the hall aforesaid, which Nicholas Whitfield had and occupied; a certain house called Potans House, under the Exchequer; and also a tower called 'Le Greenelates,' which John Catesby held and occupied, which tower and tenements are there said not to exceed the annual value of 21*l.* 6*s.* 8*d.*"

We know that Heaven, Hell, and Purgatory were to the west of the hall, and there can be little doubt that the building called in the earlier documents "Paradise" is the same as that called in later times "Heaven." Now this being the case, it seems evident that the site was built over considerably before the reign of Henry VIII.

Mr. Brewer was of opinion that the kitchens and offices connected with Westminster Hall

must have stood to the west of the hall, as there was no other possible site for them, and that the west side of the hall was only visible from two or three small courtyards, but could never have been seen from a distance, and that this accounted for its being so much more plainly treated than the north front, which was, of course, always visible from New Palace Yard. Mr. Brewer thought that the west side of the hall should be repaired, preserving all its ancient features; he could not see the necessity for a cloister, but if one were erected he thought it should be little more than "a penthouse," and might possibly be merely a temporary erection. If this were not sufficient to preserve the Norman walling, he thought it better to leave it alone altogether, rather than to erect a new building against the old hall; he also considered that nothing should be done which would render the ultimate carrying out of Sir Charles Barry's design for the completion of the Houses of Parliament an impossibility.

Mr. Ayrton was then examined. He disapproved of the proposed scheme, and considered that if anything was done, Sir Charles Barry's design should be carried out. Although he himself did not care much for architects, yet the nation having selected Sir C. Barry's design, he thought that the design ought not to be set aside for that of any one else, and he thought some of the ornament might be omitted.*

At a subsequent sitting Mr. E. P. Loftus Brock, F.S.A., gave evidence at length with respect to the antiquarian features of the building. He pointed out that originally the erections on the west side of the hall were but of one story in height, of Henry III.'s time, probably erected as an abutment to the old Norman hall, the wall of which was bending. This one story building was raised from time to time as the need for further accommodation occurred. The heights were never uniform, and there was no evidence that they were as regular as now proposed. He objected to the high two-story design on the ground that it hid the fine range of old windows of the hall except the upper portions only, a defect which did not apply to the lower design.

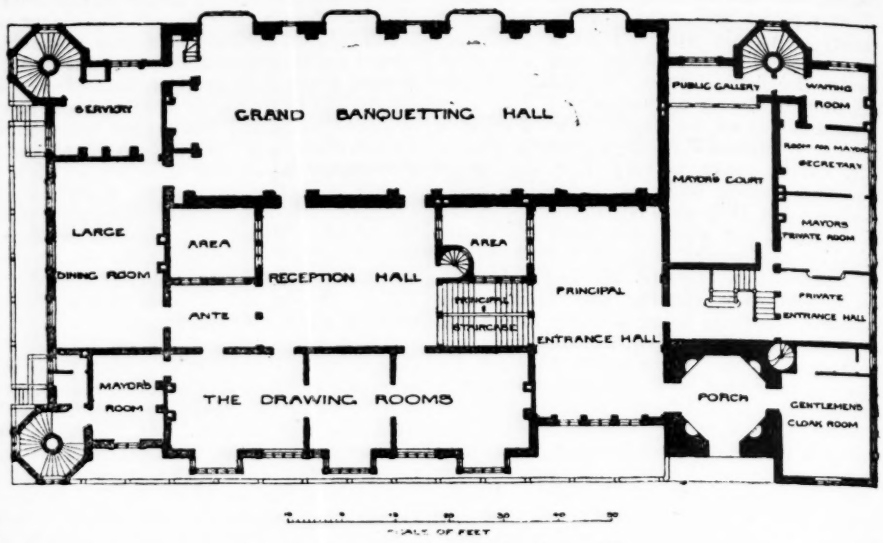
FREE LECTURES TO ARTISANS AT CARPENTERS' HALL.

THE fifth of this successful series of lectures was delivered on the 12th inst. by Professor Alexander B. W. Kennedy, M. Inst. C.E., who took as his subject "A Piece of Steel." In the course of his lecture, which was full of interest, the lecturer expressed the hope that before very long mild steel would, to a considerable extent, supersede wrought and cast iron. Castings were frequently made from the open-hearth furnaces at a price greater than that of cast iron, and with considerable difficulty and uncertainty. There was no reason to imagine, however, that these difficulties were insurmountable.

The sixth lecture was delivered on Wednesday evening last by Professor Bonney, who discoursed of "Flint," dealing, firstly, with its composition; secondly, with its production; and, thirdly, with its uses. Flint, he stated, was composed mainly of minutely crystallised silica, being most abundant in the chalk, but being found also in almost every kind of limestone rock. The formation of a flint was, to some extent, a process of replacement, and at the same time, a process of accumulation around certain spongy organisms. Broken up it made excellent road-metal, for which it was especially utilised in the eastern parts of England. When ground up and mixed with china clay, it was employed in the manufacture of porcelain. It was also largely used for building purposes, and that chiefly in the eastern counties. The professor concluded with an interesting account of the flint implements of the Stone Period.

The City and Guilds of London Institute.—Dr. Sylvanus P. Thompson, of University College, Bristol, has been appointed Principal and Professor of Physics at the Finsbury Technical College. The duties of Principal have hitherto been discharged by Mr. Philip Magnus, the Director and Secretary of the Institute, who temporarily undertook them pending the complete organisation of the College. As Professor of Physics at Finsbury, Professor Thompson succeeds Professor Ayrton, F.R.S., who has now been appointed Professor of Physics at the Central Institution.

* In other words, Mr. Ayrton would spoil the building by cheeseparing, as he spoiled the Law Courts. It is fortunate that if the building is carried out, Mr. Ayrton at least will have no control over it



Design for a Municipal Mansion.—Plan.

Illustrations.

SIR C. BARRY'S DESIGN FOR COMPLETING WESTMINSTER PALACE.

WE publish this week a drawing showing the design made in 1854 by the late Sir Charles Barry, to show the treatment he proposed for the north front of Westminster Hall, with adjacent buildings, part of the New Palace at Westminster, and in accordance with them, whereby the hall itself would acquire greatly inquired dignity, and be externally incorporated with his design for the complete building. Sir Charles, while anxious to retain the great characteristic of Westminster Hall in its noble roof, as seen from within, was evidently of opinion that externally the building did not merit the same consideration, and would not harmonise with the more important structure of which in future it was to form a part. It will be seen from the view that he proposed an entirely new gable, and between the angle towers, and from plans left by him which we have seen, he proposed to have a grand arch at its north end of like treatment to the arch at its south end, which now forms the entrance from the hall into St. Stephen's Porch. He also proposed to reface and heighten the angle towers, which now have so insignificant an effect, by raising them in a like style to the rest of the building. It will thus be seen that whenever New Palace Yard is made (as in old time) the Grand Entrance Court of the Palace, its treatment would be at least as magnificent in an architectural point of view as the river front now is, and as the land front would be if carried out in accordance with his designs as published in the *Builder* of the 24th of January last. As the Westminster Hall Committee is now sitting, under whose consideration that design will doubtless come, we may return to the subject, and the public accommodation which would be provided, to which so much reference was made by Mr. Charles Barry in his evidence given before the Committee on the 20th of November last. For the present we can only express a hope that the legacy left to the nation by one of the greatest architects of our own times will not be inconsiderately thrown away.

NEWBURY DISTRICT HOSPITAL.

THE above-named hospital, illustrated in this number, was originally designed for eight beds (male ward 4, female ward 3, and single ward 1 bed), and, by flaps, I showed how the male ward could be extended for three additional beds, and the female ward for one additional bed. It is now decided by the committee to obtain tenders for the erection of the building as shown on the plan (with male and female wards for four beds each), with alternate estimates for the extra cost of enlarging the male ward to seven beds, as shown by the dotted lines, and, if funds permit, this latter arrangement will be carried out. The committee have also decided to make the corridors 6 in. wider than shown. A cubic space of rather over 1,200 cubic feet per bed is given to the male and female wards, and of 1,300 cubic feet to the single ward. The ventilation of the wards will be effected by means of fresh-air inlets through tubes carried up to the level of the window-boards (shown on detail), and foul-air outlets through T. Boyle's "mica flap valves" at the ceiling level into a flue carried up alongside the smoke-flue in chimney-stacks. The wards are to be warmed by ventilating open fire-grates. A detail of the ward windows is given; nearly all the other windows will have the ordinary lifting-sashes, with, in all cases, a deep bead on the sill for the admission of air at the meeting-rails. The walls throughout will be built of brick, faced externally with selected red bricks up to the first-floor level, and above that plastered in rough cast stucco,—the front gable and dormers being half-timbered. The mortar and plastering throughout will be in Selenitic cement. The roofs are to be covered with permanent green slates, with red tile cresting. The floors of the corridors, passages, water-closets, &c., kitchen, and offices are to be of concrete; the other floors of tongued yellow deal. The internal woodwork is to be of the plainest character, and will be varnished throughout.

Water supply will be obtained from the town waterworks, and great attention will be paid to the sanitary arrangements.

The cost of the whole, exclusive of the furniture, &c., is estimated at about 1,800*l*.

H. G. TURNER.

DESIGN FOR A MUNICIPAL MANSION.

SOANE MEDALLION.

WE illustrate this week the design by Mr. A. B. Mitchell which obtained the Soane Medallion this year at the Institute of Architects, and of which a reduction of the principal floor plan is annexed. The author of the design has realised the idea of the stamp of building required better than any of the other competitors, though even in this case the tower is a little superfluous, and conveys too much the idea of a town-hall. Architecturally, the plain mass of the lower portion of the tower contrasts well and picturesquely with the rich fenestration of the adjoining portion of the building.

SKETCHES, MELROSE.

THE view of the east window, Melrose Abbey, and the carved terminal from a wall arcade in the cloister, are reproduced from the pencil drawings of Mr. T. MacLaren, who obtained a medal of merit in the competition this year for the Pugin Travelling Studentship. The carving is an unusually naturalistic specimen of Gothic foliage, and a very good piece of pencil drawing.

C. F. Kell Photo Lith. & Printer.

COMPLETION OF NEW PALACE AT WESTMINSTER, AS DE

VIEW OF THE SOUTH SIDE OF NEW PALACE YARD AND WESTMINSTER HALL, AS IT WOULD APP

8, Castle St. Holborn, London, E.C.

AS DESIGNED BY THE LATE SIR CHARLES BARRY, R.A.

ULD APPEAR ON ENTERING THROUGH THE PROPOSED ALBERT GATE FROM PARLIAMENT STREET.

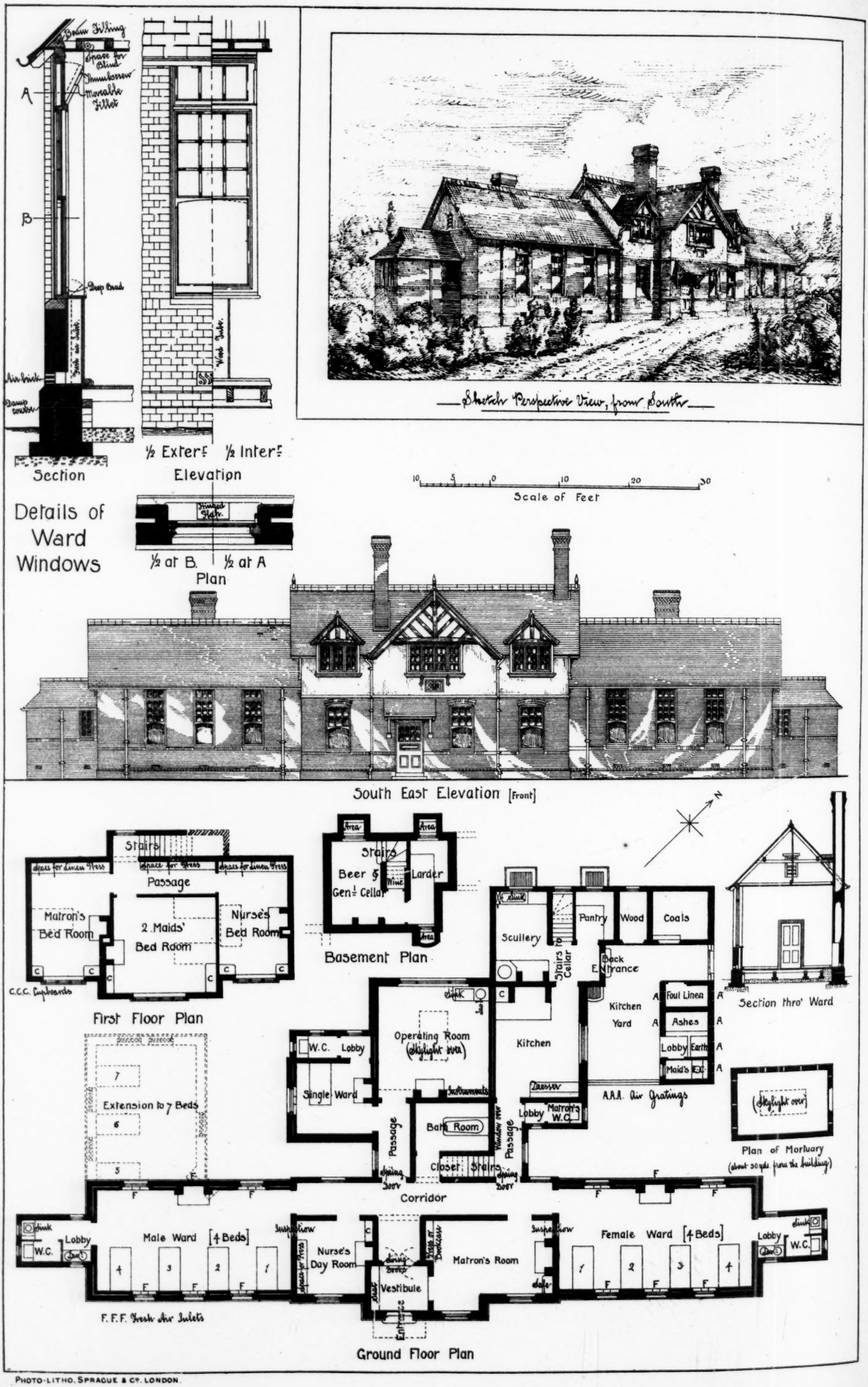
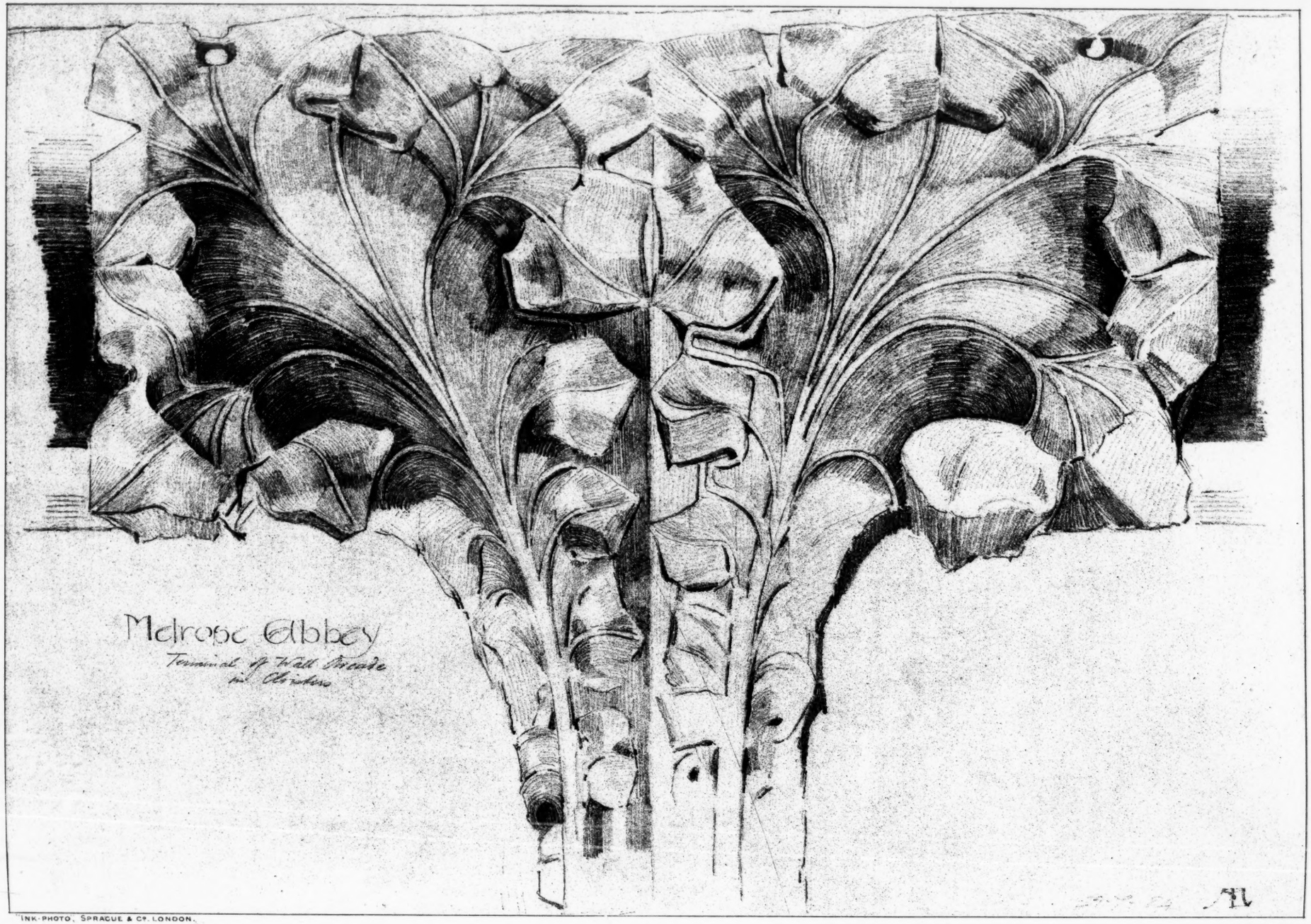


PHOTO-LITHO. SPRAGUE & Co. LONDON.

NEWBURY DISTRICT HOSPITAL.

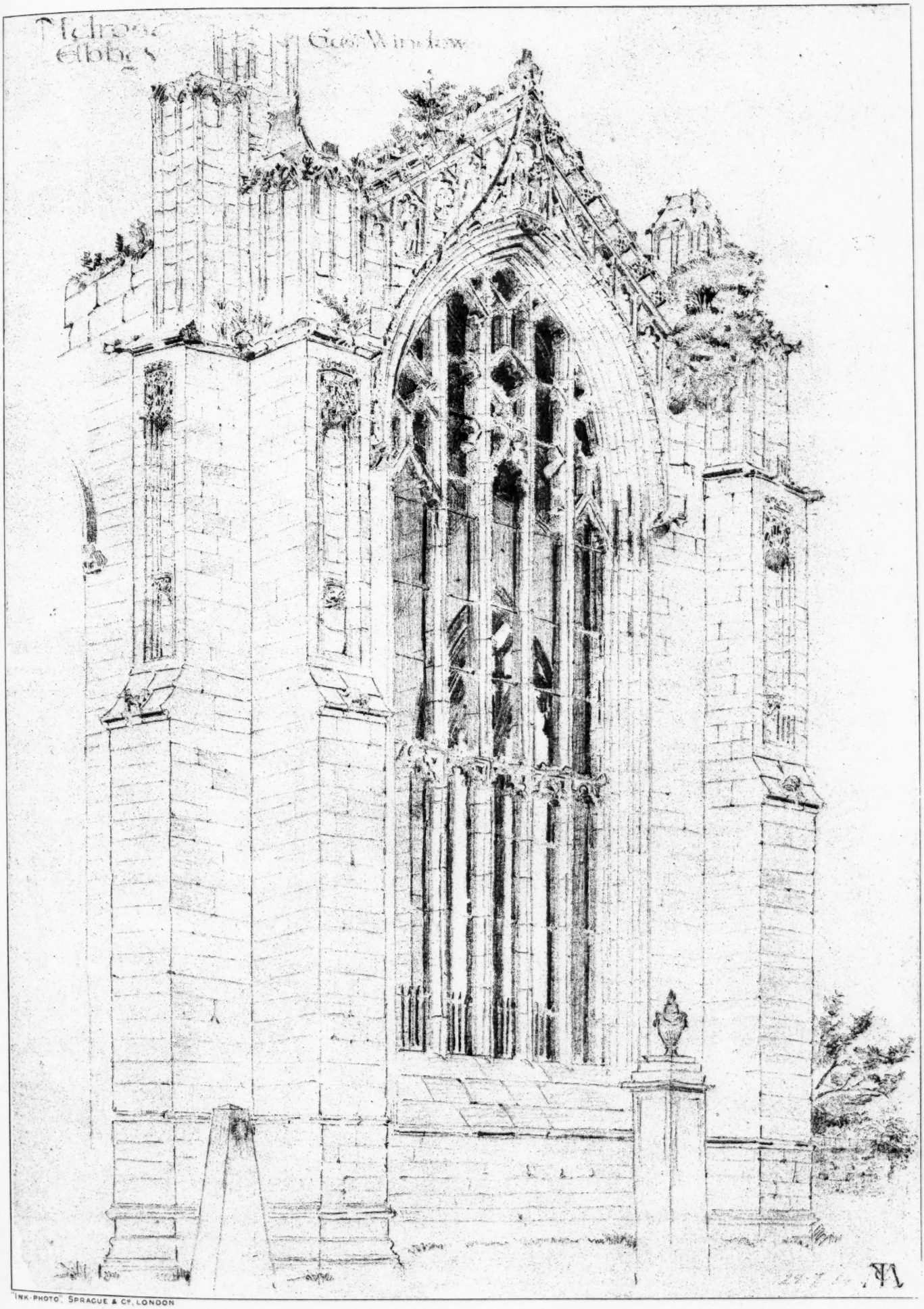
MR. H. G. TURNER, ARCHITECT.



INK-PHOTO, SPRAGUE & Co. LONDON.

Pugin Travelling Studentship
Medal of Merit, 1885.

CARVING, MELROSE ABBEY.
FROM A DRAWING BY MR. T. MCLAREN.



INK-PHOTO. SPRAGUE & Cº. LONDON

Pugin Travelling Studentship Medal of Merit, 1885.

EAST WINDOW, MELROSE ABBEY.

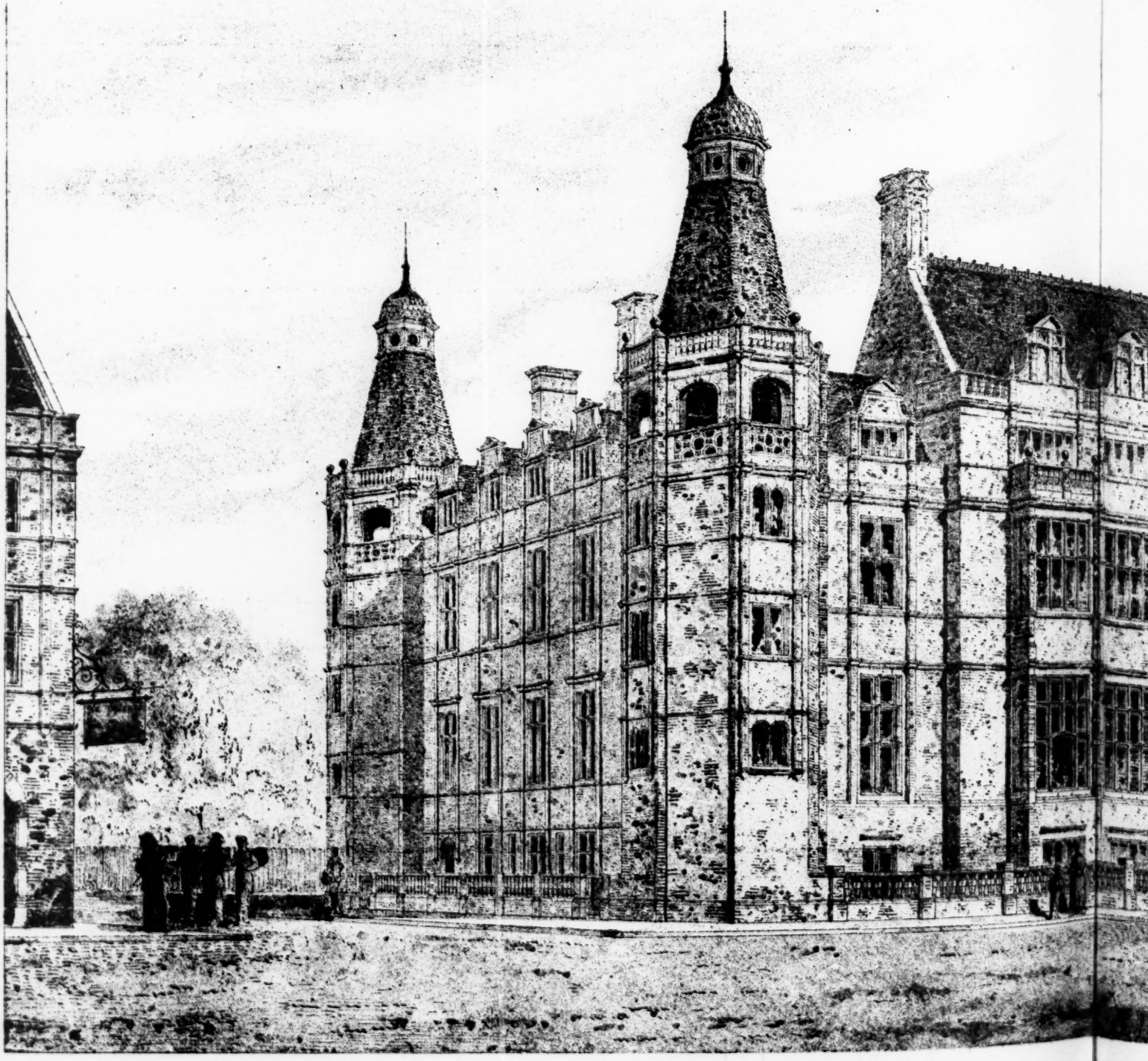
FROM A DRAWING BY MR. T. MCLAREN.

INK-PHOTO. SPRAGUE & Co. LONDON.

DESIGN FOR A MUNICIPAL MANSION.

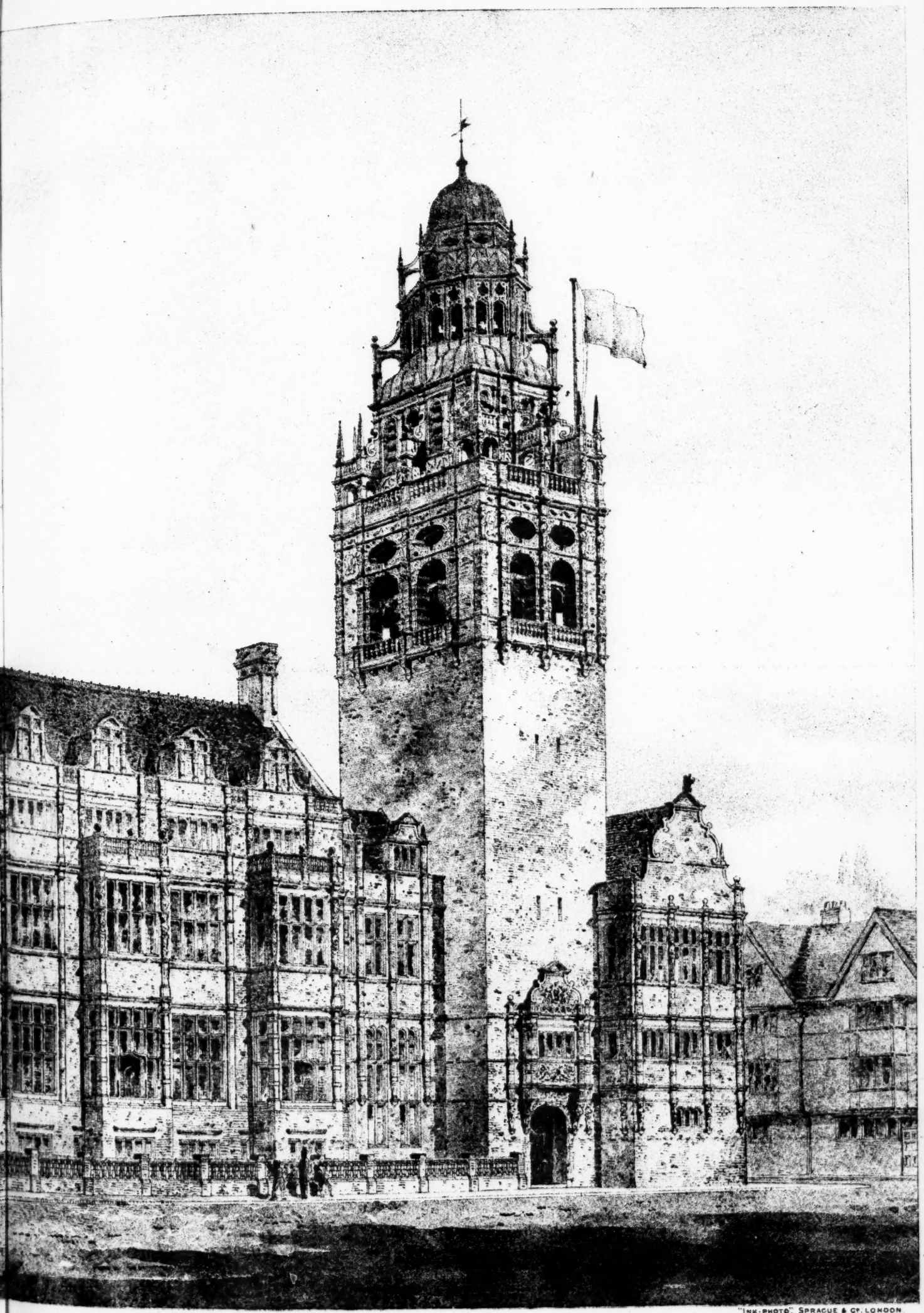
IN COMPETITION FOR THE SOANE MEDALLION.

ROYAL INSTITUTE OF BRITISH ARCHITECTS 1885.



DESIGN FOR A MUNICIPAL MANSION.

Soane Medallion: 1885.



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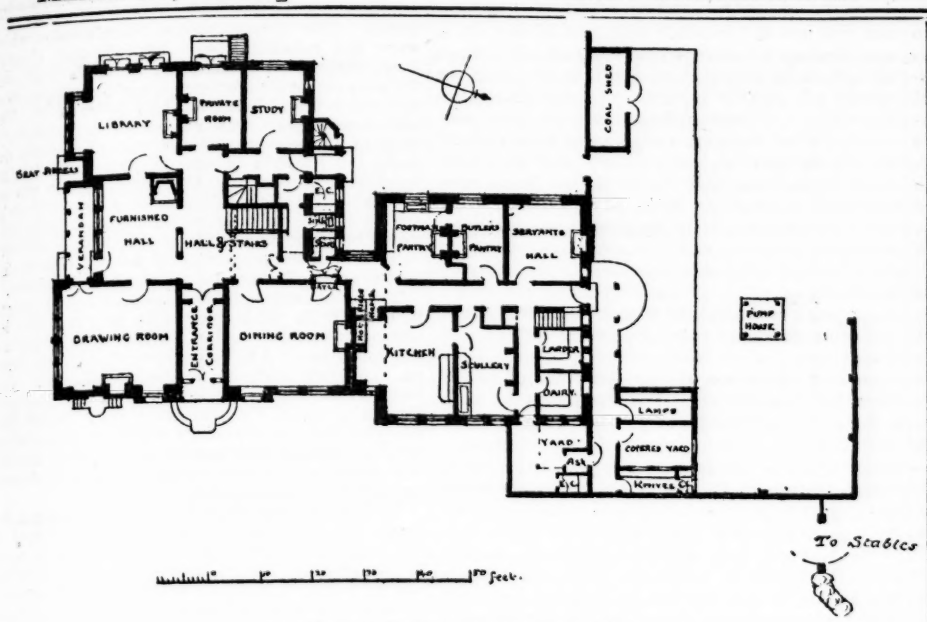
NSION. By Mr. A. B. Mitchell.



"Collyers," Petersfield.—Ground Plan.

"COLLYERS," HAMPSHIRE.

THIS house was planned to meet special requirements. The elevation of the principal front, which we to-day publish, is reproduced from a drawing exhibited in last year's exhibition of the Royal Academy, the highly original and artistic character of which we commented on at the time. It is carried out in red brickwork pointed with coloured cement, with door and window dressings and carved work in red Shawk stone, and a few moulded bricks.

The pilasters to doorway, and the hemi-vase above it, are in white hard marble. The spandrels to arch is inlaid with small unglazed black and white half-tiles. Out of the hemi-vase rises the tilting-spear, which supports the helm above, and which is represented as branching out below into (olive) leaves and fruit. A dove flies down from behind the shield, &c.

The works were carried out by Mr. John Crook, of Southampton, under the careful direction of the architects, Messrs. Bateman & Keates. All the carving was executed by the senior partner, Mr. Bateman, who informs us that he "had neither time to make elaborate detail drawings, nor temper to see them weakly carried out." We give also a small ground-plan.

BUILDING STONES.*

THE oolitic limestones which extend from Dorsetshire to Yorkshire comprise the well-known Bath and Portland beds, and the renowned Caen stone of Normandy is of the same formation. These limestones derive their name from the fact that they are composed of a number of minute oviform bodies like the roe of a fish, cemented together in a calcareous matrix. As a rule, the stone is very soft when first quarried, but hardens with exposure, and changes from a white to a yellowish tint: it is rich in organic remains. There are four distinct bands of stone in the oolitic series, viz.,—(1) The inferior oolite, which occurs chiefly in Gloucestershire, and from which the stone for Gloucester Cathedral and Tewkesbury Abbey was obtained. The best quarry at the present time is at Painswick. (2) The great or Bath oolite, which is of considerable thickness in the neighbourhood of Bath, and is generally worked by tunnelling, as in Messrs. Pictor's quarries at Box, which extend for many miles underground, and large piers of stone have to be left to support the roof of the workings. Very large blocks of this stone can be obtained. Among the best known quarries of Bath stone may be mentioned Corsham Down, Monk's Park, Coombe Down, Box Hill, and Doulting. The average analysis of Bath stone is: carb. of lime 94·5, carb. of magnesia 2·5, iron and alumina 1·2, water 1·7. The average specific gravity is 1·93. It will be particularly noticed that this stone contains no silica. The great oolite formation extends northwards of Bath into Northamptonshire and Lincolnshire, the chief quarries being at Barnack, near Stamford, the stone from which was used at Peterborough Cathedral; Ketton, from which many of the Cambridge colleges were built; and Ancaster, near Sleaford. The latter stone is often crystalline in its formation, and is an excellent building stone. (3) Coral rag, which passes from Somerset to Yorkshire with numerous interruptions. This is a rubbly stone, and is hardly ever found sufficiently compact to be used for building purposes. (4) Portland stone. This is harder and more durable than most of the lower members of the oolitic series; it is cream-coloured and full of organic remains; in fact, such a quantity of large fossils are found in it that it is unsuited for delicate work. This stone derives its name from the Isle of Portland, where it is found, the chief quarries being Gosling's, Vern-street, Waycroft, and Grove. The total thickness of the stone here is about 70 ft., but only about 20 ft. of it, and that in different layers, are suitable for building, the layers differing much from one another. First comes what is called the true Roach, which is very hard and suitable for engineering purposes, but contains such large fossils, chiefly the one well known as the Portland screw, that it is scarcely useable for ordinary building; then the white bed, which gives the best stone on the west side of the island; then the bastard Roach; and then the base bed. This bottom bed is known in the market as "best bed," a curious corruption of the word base, but it is only in special situations on the east side of the island that this bottom bed is the best. During the last two centuries Portland stone has been extensively used in London: St. Paul's Cathedral, the Reform Club, and Goldsmiths' Hall may be mentioned as some of the principal examples. Of the oolitic limestones Portland is certainly the best adapted to resist atmospheric influences, but the modern stone does not seem to be so hard as that which was used in the seventeenth century. The average analysis is carbonate of lime, 95·16; silica, 1·2; carbonate of magnesia, 1·2; iron, &c., 0·50; water, 1·6. Its specific gravity is 2·2.

In France the great oolite formation yields the beautiful Caen stone, which is very fine-grained and uniform in texture. This stone has been largely exported into England, and no finer stone can be used for interior work; but many parts of Canterbury Cathedral show only too plainly that it cannot be depended upon in a damp climate for exterior use. Mr. Hull, in his work on "Building Stones," has the following interesting remarks on Caen stone:—"The introduction of Caen stone into Britain is curiously interwoven with history. It was probably introduced shortly after the Norman Conquest, having been a favourite stone with the architects who followed the fortunes of William Duke of Normandy and his successors. Its introduction into Ireland may have been of a still earlier period, corresponding to the introduction of Norman and Lombard styles into that country. In England, however, it was largely used in cathedrals and other buildings down to the middle of the fifteenth century, when Normandy was lost to Britain, and it is only in modern times that its use has been revived."*

An English stone closely allied to the Caen stone has recently been pushed energetically in the London market, although it has been in use for many years in the neighbourhood of the quarries. I allude to the Beer stone found near Axminster, in Devonshire, with which the new Empire Theatre, in Leicester-square, has been faced. It is a close-grained, even-coloured stone, but somewhat friable, and I fear that it is scarcely likely from its composition to stand the trying ordeal of the London atmosphere.

Although each class of building-stone contains numerous sub-classes, I have now described the three great divisions which comprise the principal building stones, and I must ask you to follow me in a brief consideration of the qualities which are required in a stone for it to endure when exposed to the weather. I put aside altogether the use of stone for ornamental internal work; what we want to know is, will a stone stand exposure? Now before this question can be answered it is necessary that we should have some sort of notion of the causes of the decay of stone. These are, in the main, two, disintegration and decomposition, the former acting mechanically and the latter chemically, and the two causes generally act together. All stones, even granite, absorb a certain quantity of moisture, some more, some less, and, as a general rule, those which absorb the most water are most liable to disintegration, because, after absorption, on the occurrence of the slightest frost, the absorbed water expands, and, by mere mechanical pressure, forces apart the minute particles of which the stone is composed.† Hence the rate at which a stone absorbs water and the readiness with which it parts with it are very important elements to be considered, much more so, in fact, than the total amount of water which a stone will take up. Experiments have frequently been made to ascertain the proportion of water to its own bulk that a stone will take up when completely saturated; but, although this is an important fact to know, practically stone in a building never has to submit to such a test. It is the constantly-recurring showers and the generally moist atmosphere of this country which play such havoc with our building-stones, and it will be readily understood that if one sample of stone when completely saturated absorbs ten per cent. of its own weight of water and another only eight per cent., yet if the former take three times as long as the latter to become saturated, it is, *cæteris paribus*, the better stone. A complete series of experiments as to the rate of absorption of water would be of great service, but care would have to be taken that at the outset of the experiments all the specimens should be perfectly dry, otherwise the results obtained would be misleading. No kind of stone is so variable in this property of absorbing moisture as sandstone, and hence it is extremely important to test it beforehand.

In London, and in any place where the climate is damp and the atmosphere smoky, the mechanical disintegration of stone is largely assisted and frequently started by chemical decomposition, and in order to guard against this a careful examination of the chemical analysis of a stone is very desirable. The sulphurous and hydrochloric acids in the atmosphere, which are readily taken up by rain-water, act upon the calcareous ingredients of stone, producing oxidation or hydration; where mineral salts occur, various chemical reactions take place, and minute crystals are formed in the interior of the stone which effloresce outwards; and where organic matter exists, as is the case in nearly all stratified deposits, this gives rise to nitration. Inorganic matter, such as the quartz-crystals which form so large a component in the structure of granite, and the

* Continuation of a paper by Mr. John Slater, B.A., read at the meeting of the Architectural Association on the 6th inst. See p. 367, *ante*.

* The following quaint quotation from Harrison, who wrote in Queen Elizabeth's time, and who endeavoured to establish a better reputation for English quarries, is interesting:—"Our elders have from time to time, following our naturall vice in misliking of our owne commodities at home, and desiring those of other countries abrode, most esteemed the Cane stone that is brought out of Normandie, and manie even in these our daies following the same veine, doo covet in their works to use no other. Howbeit, experience on the one side, and our skilful masons on the other, doo affirme that in the north and south parts of England, and certain other places, there are some quarries which for hardness and beautie are equal to the outlandish greet. This maie also be confirmed by the King's Chapel at Cambridge, the greatest part of the square stone whereof was brought thither out of the north."

† See *Builder* for July 12, 1884 p 51.

eroded grains of which enter very largely into the composition of many of the sandstones, is not acted on by these acids, so that in a sandstone the nature of the cementitious material which binds the grains together is the important point to be looked to; the more siliceous this is and the less calcareous the better. In fact, you may lay it down as a general rule that the more silica you have in a stone the better. If the cementing substance is calcareous, that is, composed of lime, its presence can be detected by the use of dilute hydrochloric acid poured on the stone, which will cause effervescence, and if a powerful action is set up this will show that carbonate of lime is present in considerable quantities. When we come to the limestones their main constituent is carbonate of lime. In the magnesian limestones there is a certain proportion of silica, and they are also crystalline in texture, and it is to these qualities that they owe their durability; but their chief constituents are carbonate of lime and carbonate of magnesia. The Commissioners of 1839, who recommended the use of this stone for the House of Parliament, correctly appreciated its good qualities, but they appear totally to have ignored the fact that magnesia has a strong affinity for sulphur, which exists so largely in the London atmosphere, and hence has resulted the terrible decay in the stone used in the Houses of Parliament. When we come to the oolitic limestones, such as Bath, we find no silica at all, but almost entirely carbonate of lime; but as the stone is soft and easily worked, it has been largely used for copings and dressings to brick-built houses in London, and it looks very well when first put up. But in the case of the majority of the pretentious stone enrichments of suburban houses, no care whatever has been taken that the stone should be weathered before using, and it is no uncommon thing to find such stone crumbling away after two years' exposure. But however well this stone may have been weathered, it is extremely doubtful whether it ought under any circumstance to be used in a smoky atmosphere. For dry climates where there is little smoke, and for internal work, it is, however, admirably adapted, as it can easily be worked into most intricate mouldings; but it must always be remembered that in external work elaboration of ornament means increased liability to decay.

You see, therefore, how necessary it is to ascertain something about the chemical composition of a stone. But what I may call its mechanical properties are no less important. You must examine (1) its hardness,—a soft, easily cut, stone will not, as a rule, be so durable as a hard crystalline one; (2) its weight,—as the denser a stone is, *i.e.*, the greater its specific weight, the more likely it is to last; (3) its compactness, *i.e.*, the closeness of its structure; (4) its porosity; and (5) its colour, if uniformity is desirable. Mr. Hull says that an original blueish grey tint should be avoided, as this indicates the presence of iron, and oxidation will frequently produce an uneven yellowish tint. Now, all these latter points you can examine for yourselves, and you should always have a specimen of the stone you intend to use in a building to make a few tests of it. There are two other very simple practical tests which I may mention: one is called Smith's test, and it is to take some small chippings from a piece of stone which has been well wetted and put them in a glass of water, and let them remain for some time and then gently shake the glass; if the water gets somewhat turbid it shows that there is a certain amount of earthy matter present in the stone. Another test is to boil small pieces of the stone in a solution of sulphate of soda, after which the stone will disintegrate if it be of a perishable nature. This test is, however, a very severe one, and I do not think it would be necessary to discard every stone which did not stand this test.

When a stone has once begun to decay it is very difficult to stop the process, but several different methods of treating the stone on its first being fixed in order to prevent decay have been recommended, such as Szerelmey's, Hutchinson's, Ransome's, Kühlmann's, and others, but as I have not had any practical experience of them I can say nothing about them. I have used boiled linseed oil, which certainly prevents water entering the pores of a stone, but it slightly darkens the colour of the stone, and I am disposed to think the application ought to be renewed every few years.

I have frequently mentioned the bed of a stone, and you are all familiar with the clause in a specification which says that stone should always be laid on its natural bed, and it is well that we should all clearly understand why this is so desirable. I have pointed out to you that nearly all our building-stones have been formed by the deposit of sedimentary matter, layer upon layer, and that these layers have consolidated during the lapse of ages, partly by chemical action, partly by heat, and partly by enormous pressure, and however compact a stone thus formed may now appear, all these layers are really existent. Now if you can imagine a great piece of cardboard a foot thick formed of numerous sheets of paper gummed together, and then pressed into a compact mass, you will have some sort of notion of the structure of one of these building-stones. If you were to take such a piece of cardboard and press it in the same way in which it was pressed during its manufacture, you would only consolidate it the more, but if you were to put it on end, then begin to squeeze it, you would not have much difficulty in separating the various sheets from one another, and they would soon begin to fall away, and this is precisely what takes place when stone is not laid on its natural bed. Of course you would not often find that the ordinary pressure of superincumbent weight would actually squeeze out the layers of stone, but it would tend to loosen them, and would greatly facilitate the entrance of water between the layers, which would speedily begin to flake off. There is one other practical point which should always be carefully attended to, and that is that the bedding joints of blocks of stone should be accurately dressed and perfectly level. If this is not looked to, you will get unequal pressure and cross strains set up, and stone is one of the worst materials possible to resist cross strains, which is the reason why we so frequently see lintels over window openings cracked.

In conclusion, I must repeat one caution which I have already alluded to, and that is, do not take any stone on the credit of its name. The quality of the stone extracted from a quarry is always changing, and for a large building it is necessary constantly to examine the blocks of stone as they are delivered from the quarry. If you do this, if you also submit specimens of stone to a few simple tests, and ascertain its nature, you will be spared a great deal of worry and disappointment in seeing your buildings begin to decay before your eyes.

[Specimens of the various kinds of stone referred to were exhibited, and their mechanical and chemical characteristics exemplified, during the reading of the paper.]*

THE SANITARY USES OF DISINFECTANTS.

ASSOCIATION OF PUBLIC SANITARY INSPECTORS.

A PAPER on "Disinfectants," prepared by Dr. J. W. Tripe, Medical Officer of Health for the Hackney District, was read by Mr. G. B. Jerram (the President) at the last meeting of the Association of Public Sanitary Inspectors, Adam-street, Adelphi. Strictly defined, Dr. Tripe regards as disinfectants such substances as when used in proper quantity, and under suitable conditions, take away from any infected body or thing its power of reproducing itself in an uninfected body, and he divides them into two principal classes, viz., germicides which destroy, and antiseptics which arrest, the active principle in specific contagion or infection. In order to be properly employed, the limits within which any particular disinfectant works should be so definitely known that each might be precisely adjusted to the work it is best fitted to perform. An infinitesimal amount of infectious matter was often sufficient to produce the most violent results, and the great danger of filth was not its mere offensiveness, but the presence therein of morbific elements in a solid or gaseous form. Disinfection, to be useful, must, therefore, be perfect. It was unfortunate that the three *desiderata* of cheapness, general utility, and freedom from poisonous qualities could rarely be found in the same disinfectant. The interesting experiments made by Dr. Klein on swine, some of which were briefly described in the paper, would prove, if confirmed by further experiments, that sulphurous acid gas was one of the most powerful of "aërial disinfectants," and would justify the preference now generally accorded to it. The practice of sprinkling with disinfectants was worse than useless as commonly carried out. Dry heat was one of the most certain and useful disinfecting agents. The respective advantages and disadvantages attending the use of the desiccating processes of Fraser, of Jennings, of Lynn, and of Ransome, were compared. The proper use of disinfectants which were not germicides was also indicated, Condy's fluid, carbolic acid, chlorine, Burnett's fluid, and the more recent disinfectants,—enchlorine, sporoctor, and chloratum,—being all here referred to. The last-named agent was considered unsatisfactory, because it neither removed offensive smells nor destroyed bacteria in sewage, unless added in an inordinate proportion. Carbonate of lime was an element in McDougall's powder and in Culvert's, and an efficacious mixture for cesspools and drains would be found in a mixture of quicklime and carbolic acid in the proportion of 6 lb. of lime to one pint of acid. Terebene was a powerful deodorant.

The offensive smell from the openings of sewers in our streets we believe to be best remedied by placing animal charcoal in perforated trays between the openings; but to be effective the charcoal must be kept dry and be frequently changed. The lecturer, in conclusion, said he had not exhausted the list of useful disinfectants, many of which, like salicylic acid, were chiefly used as preservative agents. Some others, such as arsenic, chromic acid, and corrosive sublimate were either too dangerous or expensive for ordinary use.

In the discussion which followed the reading of the paper, Mr. Kingzett, the chairman, and several of the sanitary officers present, expressed opinions as to the practical use of disinfectants, Mr. Kingzett stating that he considered the fluids and "Sanitas" oil to be the most satisfactory yet known, because they could be applied to the largest variety of purposes. No disinfectant could, however, be useful for all purposes, as the properties which rendered them efficacious in some cases would not fit them for use in others.

At the opening of the proceedings a testimonial to the secretary, Mr. Legg, consisting of a purse and twenty guineas, subscribed for by the members, was presented by the President, and the customary vote of thanks to the lecturer brought the proceedings to a close.

* Some notes of the discussion which followed the reading of the paper will appear in our next.

THE WESTMINSTER HALL COMMITTEE.

SIR,—In the evidence given by Mr. Ayrton before the Committee, now sitting, on Westminster Hall he stated that his opinion was that nothing should now be done to prevent the plan of Sir Charles Barry being carried out, so far, at least, as that design comprises a building extending along St. Margaret-street from St. Stephen's Porch to a point in a line with the north front of Westminster Hall; that it should terminate there, but be united to the north front of Westminster Hall at the flanking tower of that front; the whole in accordance with the design of Sir Charles Barry.

It may be well to state that though this would not, as I think, do all that would be desirable, inasmuch as it would not enclose New Palace Yard as the great entrance court of the New Palace, it would have, at least, the advantage of bringing into harmony all the external façades of the New Palace, and I should welcome such a scheme for that reason, as far as it goes.

Now that some of the buttresses of Westminster Hall have been restored in model only, with detail necessarily entirely out of scale with that of the New Palace, the effect is, I think, so unfortunate as to make evident the desirability of screening the Hall, as proposed by my father, with (as I am glad now to hear) the approval of Mr. Ayrton.

A glance at the drawing of my father's design, published in the *Builder* of the 24th of January last, will at once show that it perfectly lends itself to such a partial execution of it, and that a good and complete effect would then be produced when viewed from the end of Parliament-street.

I have stated roughly that the cost of realising the *whole* of my father's design, including the enclosure of New Palace Yard, would, I estimate, be about 500,000*l*. To carry out the portion to which I have above referred would cost about 220,000*l*. out of the total of 500,000*l*.

Such portion of the design would provide eight committee-rooms on the principal floor and the floor over, larger than those in the river front (which are often found too small for important committees), as well as twenty-six other rooms available for public use on the ground-floor and the upper floor, or thirty-four additional rooms in all.

CHARLES BARRY.

1, *Westminster-chambers*, 16th March, 1885.

International Inventions Exhibition.—His Royal Highness the Prince of Wales, President of the International Inventions Exhibition, has fixed Monday, the 4th of May, for the opening of the Exhibition.

THE DECORATION OF ST. PAUL'S CATHEDRAL.

Sir,—It is sufficiently easy to write a few notes of criticism upon the decorations now set up in the cathedral, but we can well appreciate the fact that the committee has evidently found the greatest difficulty in arriving at a conclusion and feeling its feet on solid ground. It must not be forgotten that the examples of such decorations are few; that in this country, at least, nothing of the sort has been done, whilst the building to be dealt with is the second greatest church of its class in Christendom.

Before offering any remarks on the cartoons, one may not unreasonably attempt to face some of the difficulties which arise.

1. Perhaps the first is that of scale. We all know that a fault, very prominent in St. Peter's at Rome, less prominent, but still very present in St. Paul's, is the clumsy scale of the details, reducing, as it does, the apparent size of the church by at least one-third. This defect reaches its climax in the monstrous key-stones below the whispering-gallery, which gallery is only saved from appearing as a mere cornice by the scale given it by the rich wrought-iron railing with which it is crowned.

2. The second question which rises, and which it is submitted should never have arisen had the so-called decoration been rightly conceived, is,—Is the matter in hand that which it pretends to be, the decoration of the existing building, or are the decorations to take the first place, using St. Paul's as a mere vehicle for the display of such decorations?

3. A third point is, what relation are the decorations to bear with regard to the treatment of the entire building?

4. Are we entitled to take a master work to destroy in it the relation of parts which its designer established, to dwarf it in effect, and to alter its structure for the sake of displaying our decorations?

With regard to the first question or difficulty, it cannot be doubted that we cannot be wrong if our decoration is manifestly subservient to, and not dominant over, the design of the author of the building. What do we find? Although Wren's detail is large and crushing in scale, the "decorations" dwarf it to mere insignificance. That which made the building look small is now made itself to look small. Our eyes cannot get free from the coalheaver prophets and gesticulating giants posturing in the spandrels of the pendentives. The decorations are out of scale. This brings us, at once, to question number two. There should be but one answer to this. There can be no doubt that the present works entirely sacrifice the cathedral and turn it into a mere shell, on the blank surfaces of which efforts are being vainly made to rival Michelangelo. But is Michelangelo's work sublime merely because it is big, and is an imitation of his work appropriate to St. Paul's, even if there were any living man who could approach his power? He could do what he liked on the roof of the Sistine Chapel. That building is hardly an architectural work. The Sibyls do not crush their surroundings in the way that the cartoons in the pendentives at St. Paul's assert themselves above the building they profess to decorate.

If we are to choose between the cartoons on the north or south side of the dome, the north side has the advantage. It is more numerous in its parts, more interesting, and does not emphasise that which is, no doubt, somewhat of a fault in the design of the church, an excess of height in this part,—a height so excessive that it reduces the nave and choir to insignificance. The cartoon on the south side is as crushing in scale and as commonplace as could be imagined, and makes the pointed section of the dome more marked than it was before.

The idea of the dome is that of a great inclosed space, and undoubtedly that was Sir Christopher Wren's notion of it. He starts from the floor with eight sub-divisions, then sub-divides into twenty-eight, grouping these in a very subordinate way. The cartoon on the south side brings us back again in the most violent way to eight sub divisions, quite ignoring Sir Christopher Wren's multiplication of parts as he carries the eye from the eight great arches.

Wren's system of multiplication emphasised space, but this system of decoration merely emphasises height. The value of the iron railing above the whispering-gallery to give scale to the drum of the dome has been already noticed. The decorators have, however, been anxious to set Wren to rights, and to crush his poor efforts.

All manner of devices have been tried on the drum.

On the north side a gigantic text, with thin letters on a gold ground, reduces a good high wall to a mere band, and brings a surface of almost unbroken gold so near the eye that it completely kills the gold in the dome above. One would have supposed that the gold and sumptuousness would have increased as the decoration increased upwards. And, after all, a great flat surface of gold is not decoration; it is merely glare.

The attempt at decoration of the drum on the south side is truly melancholy. This space, the great continuous wall which seems to tie together the base of the dome, is emphatically subdivided into eight parts, exactly as Sir Christopher did *not* do it. To effect this, the over-large keystone of each great arch is surmounted by a still more prodigious bust of a prophet, or some other worthy, peering out of a circle, over the railings. Each circle is joined to its neighbour by enormous and uninteresting scrollwork, so that that part of the building, which by the ingenuity of its designer was left quite plain, and gave one the sense of horizontality and continuity, is now cut up into eight parts, emphatic and enormous.

Below the whispering-gallery are a series of eight spandrels,—fields for the decorator. Upon these there were faint traces of an architectural type of decoration following the inclosing lines of the spandrels.

The decoration thus suggested was, perhaps, commonplace enough, but, at least, it did not sacrifice the building. This is, however, done away with, and enormous figures of evangelists and prophets half fill the spaces, leaving vacant large areas of the gold ground on which the figures are depicted. From many points of view these figures are little better than black silhouttes on a ground of yellow light. From every point they simply crush the building, and do not even fit the spaces they pretend to occupy. Figures seated on thrones or in circles or hexagons would by such a treatment, at least, be wedded to the architectural lines of the building they are supposed to decorate; as they now appear, the feeling suggested is that the spandrels are too small and the picture is cut down to fit them. Setting aside the text on the gold ground, the unoccupied surface of the spandrels now shows the greatest amount of gilding, and has the effect of fixing the eye at this level. The ceilings in the "Stanze" at the Vatican would have suggested some more suitable treatment, something less assertive.

The third point that has been raised is "What relation are the decorations to bear to the treatment of the entire building?"

We cannot suppose that the gilding is to come to the floor level. The structure, unlike St. Peter's, is of stone, and cannot with propriety be faced with marbles. We have then a sober key of colour to begin with; the enrichments increase as we ascend, and Wren has left large spaces on the vaults obviously for decoration. If a climax of glare is established before we are half-way up; the whole scheme, as estat lished by him, is overthrown.

By way of further destroying his surfaces and the repose of the building, the coffered soffits of the four great arches carrying the dome have been touched with a commonplace French grey. These great soffits, perhaps the most important constructive arches in the building, have hitherto presented to the eye an enriched surface; they seemed full of power to do their work. The one that is painted is frittered away into a mere gridiron of vertical and horizontal lines. The sense of structural unity is obliterated.

If we are entitled to deal with a master work as we choose, and make of it a mere vehicle for our decorations, and to alter its structural lines, then perhaps a justification may be found, not only for the cumbersome prophet, but even for the suggestion to put up sham coffering over the "quarter galleries." It would be absurd to profess admiration for Wren's treatment of this part of the church. But can a defence be found for putting coffers on a vertical face, and in immediate juxtaposition with the coffers on the soffits of the great arches? Even if Wren had done it elsewhere in a diminished form (and he has not in any place that is the least similar to this), it would not make it defensible here.

There is one decoration which Wren has already begun, and which, if carried round the church, would not only add to the effect, but assist the scale of the building. I refer to the gilt railing on the great cornice at the west end of the nave. This rail is unnecessarily high, and need not be continued of the same height. The lower it is kept, within reason, the greater scale will it give. As so many experiments are being tried, it may be suggested that one in this direction should also be tried.

A few boards painted dark stone colour, and with imaginary railings thereon, would, at once, show the effect.

Somers Clarke.

15, *Dean's Yard, S.W.*, March 11, 1885.

IRON TIE-RODS IN SPIRES.

Sir,—An architect informs me that it is a general practice to introduce tie-rods of iron to resist the "spread" of spires.

Molesworth gives ·71 × pressure = power required to overcome the friction of stones on stones, which I take to imply the stability of a very flat spire without tie-rods.

If unnecessary, the introduction of rods of iron must be a great evil, unless, indeed, they gradually form channels by their expansion and contraction, and so have room to play without injury to the masonry. P.

*** It is unquestionably a great evil; nor is it correct to say that it is a general practice.

TAXATION OF SURVEYORS' CHARGES IN COMPENSATION CASES.

Sir,—Referring to the letter of Mr. Banister Fletcher, which appeared in your journal of March 14th [p. 398], we must repeat that there was an utter want of principle displayed in the taxation in the case referred to in our previous letter [p. 359]. We were drawing attention, not to a general principle, but to a particular application (or non-application) of the principle. You would not have been troubled by us if two surveyors' fees had been allowed; but, as a matter of fact, the total sum allowed did not nearly amount to one surveyor's fee upon Ryde's Scale, and we considered that a further injury was done to the profession collectively and individually by the manner in which this inadequate amount was apportioned.

If the taxing-master had even said, I will allow one surveyor's fee on Ryde's Scale, there would have been some principle in it, but to allow one surveyor 37*l.* 16s. and another 6*l.* 6s. was putting the matter in the most objectionable form, as clients have an erroneous idea that the taxing-master is an expert, and is giving to each surveyor the amount to which he is properly entitled as remuneration for services rendered, and it is a positive injury to make it appear that a surveyor of high position is to be compensated for services such as were rendered in the case referred to by a payment of 6*l.* 6s. or even 37*l.* 16s. Lee Bros. & Pain.

THE SEWAGE DISPOSAL QUESTION.

Sir,—I do not know whether it has ever been considered practicable by experts to treat sewage with sulphate of lime or plaster of Paris. If a small quantity of this material be stirred into sewage and allowed to settle, the water will be quite clear and inodorous, and the solid parts precipitated into a stiffish mass, which could afterwards be dried and sold for manure. The value of gypsum or sulphate of lime for manure is, I believe, alone considerable; and it would be increased in value by the addition of sewage. On a large scale the sulphate of lime could be produced in London at about 25s. per ton, and one ton would produce one ton and a quarter of dried precipitate. W. B. Wilkinson.

Architectural Association.—The fourth Saturday afternoon visit of the Architectural Association was made, on the 14th inst., to the new Infirmary for the Hampstead Workhouse, at New-end, built from the designs of Mr. C. Bell, of Dashwood House, Broad-street. About forty members assembled, at three p.m., at the Infirmary, and were met by Mr. Bell, who conducted the members over the building. The Infirmary is the largest circular ward that has been built in England up to the present date, being 50 ft. in diameter. The circular form was adopted in order to avoid interfering with the light and ventilation of the adjoining buildings. We gave a plan and description of the building in the *Builder* for February 2, 1884. The members afterwards visited Messrs. Read Bros.' new beer-bottling stores at Kentish Town, of which Mr. Theodore K. Green is the architect. Here the members were received by Mr. Green, jun. A view and description of these buildings appeared in our pages a few weeks ago (February 7).

The Student's Column.

DESCRIPTIVE GEOMETRY.—VII.

WE have already several times applied the general method of finding the vertical trace of a plane on a new elevation; it consisted in drawing a horizontal line of the plane and finding the point where this line penetrated the new elevation, giving us thereby one point of the trace required; but in many cases we have a much shorter way of finding a point of the the new trace as given in fig. 36, for the two elevation planes intersect one another in a vertical line over *a* as seen in sketch fig. 37; therefore the height of C^{v1} over $L^1 T^1$ will be the same as that of C^v over L T. The same operation holds good when the plane of the plan is changed so as to make an auxiliary plan, as in fig. 38; it is exactly the same case as the former, only the intersection of the horizontal planes is a horizontal line, as can be seen by fig. 39, which represents the operation in perspective.

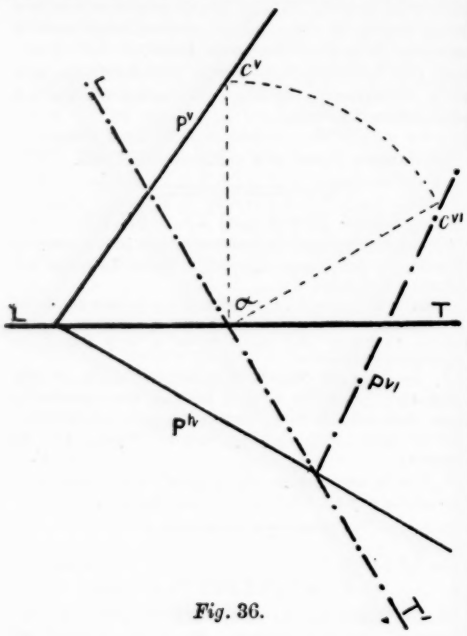


Fig. 36.

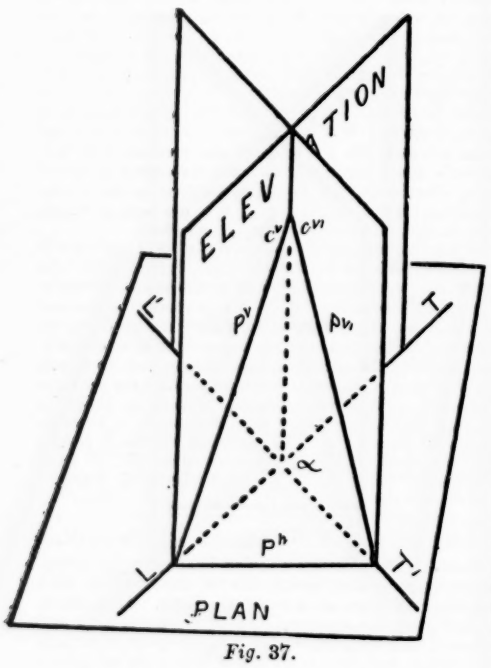


Fig. 37.

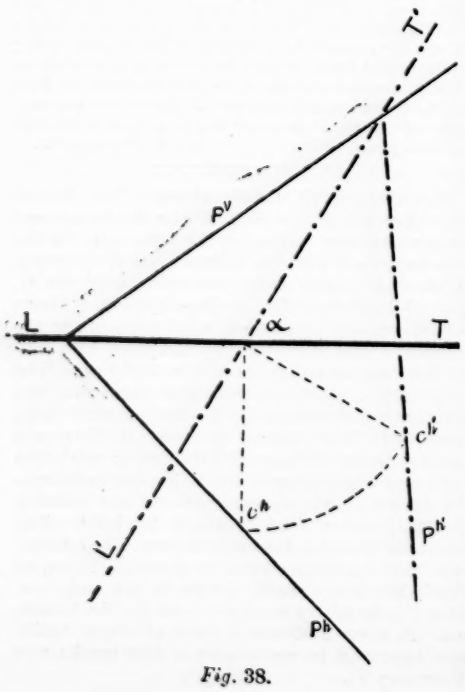


Fig. 38.

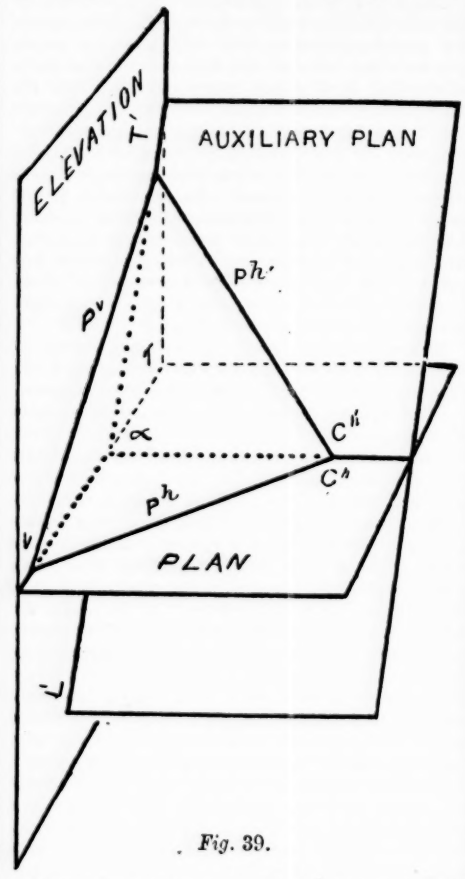


Fig. 39.

Applications of the method of using auxiliary projection planes; in other words, auxiliary elevations and plans.

Given a line D *by its projections* D^h *and* D^v; *select other projection planes in which the line* D *will be perpendicular to the plan,—in other words, in which* D *will be vertical.*

We first make a new elevation on $L^1 T^1$ parallel to D^h when we shall see D^{v1} with its real inclination; then we make a new plan on L^{11} T^{11} which we select perpendicular to D^{v1}. In this last projection of the line D we shall have for D^{h11} only a point at an equal distance from L^{11} T^{11} as D^h was from L^1 T^1, and D^{v1} will, of course, remain the elevation. To realise this operation the student need only turn the paper round so as to place L^{11} T^{11} horizontally before him, but, if he have time, we strongly advise him to construct the whole operation with pieces of board for the divers projection planes and a piece of wire for the line D. (See fig. 40.)

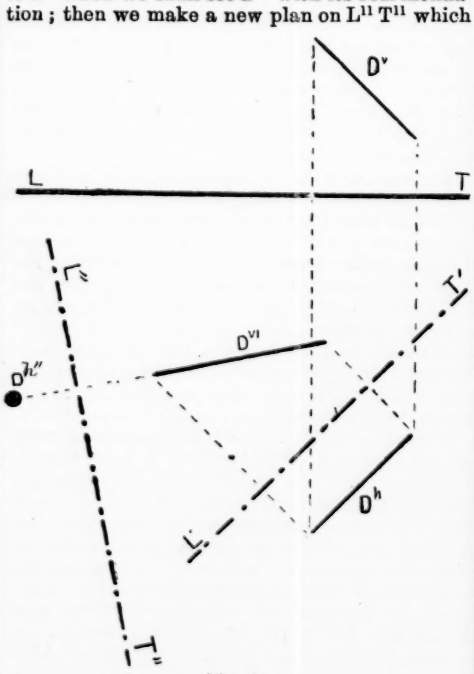


Fig. 40.

Given a line D *by its projections* D^h *and* D^v, *select other projection planes in which* D *will be perpendicular to the elevation.*

This is exactly the same problem as the former, except that we begin by first making a new plan on L^1 T^1, parallel to D^v, and then we finish by making a new elevation, D^{v1}, perpendicular to D^{h1}, as in fig. 41.

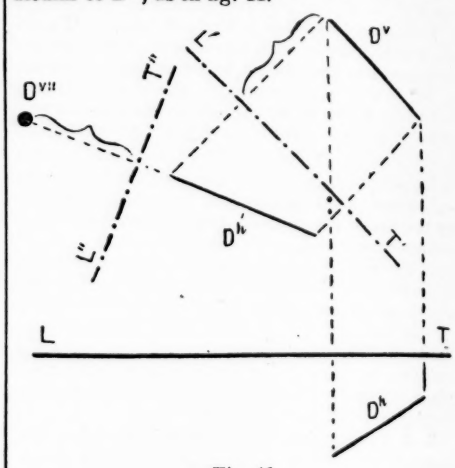


Fig. 41.

Given a plane P *by its traces* P^h *and* P^v, *select other projection planes in which* P *will be part of the plan itself.*

We begin by making an elevation on a plane at right angles with our plane P; for this we simply take L^1 T^1 perpendicular to P^h, and draw the new trace P^{v1} by one of the methods already known. The plane is now defined by the traces P^h and P^{v1}, but, if we change our horizontal plane of projection and take for L^{11} T^{11} the trace P^{v1} itself, the plane P will be contained in our plan; there will be no more horizontal trace whatever, and the vertical trace will be our ground-line itself. (See fig. 42.)

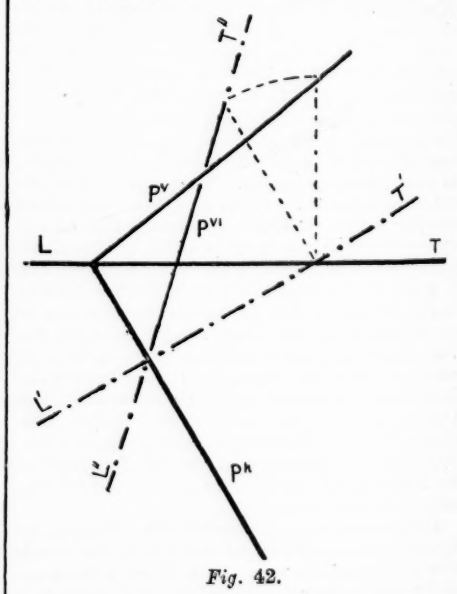


Fig. 42.

Soudan Expedition.—Messrs. Fraser & Fraser, steam boiler-makers, Bromley-by-Bow, obtained the order for the supply of nine immense wrought-iron tanks, to occupy the entire hold of the s.s. *Woodcock*, which is to be stationed at Suakim as a water-ship for the use of the troops. The order was received by Messrs. Fraser & Fraser on Saturday, February 28; the iron, which had to be expressly made for the work in Staffordshire, was delivered to them on the following Saturday, March 7; and in *one week*—viz., on Saturday, March 14—Messrs. Fraser & Fraser had the satisfaction of delivering and fixing the whole of the tanks in the hold of the vessel. This is quick work.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

916, Fire-extinguishing Apparatus. G. J. Sturt.

Separate pipes are led to each room or passage. Levers for operating the valves are marked with the number of each room, and connected to the valves by wires and cranks or rods. The levers may be outside the building if wished. A pipe is laid to and in each room, which terminates with a jet or rose, and water is turned on to extinguish fire.

3,138, Filter. F. H. Landon.

This filter is made sufficiently buoyant to float on the surface of the liquid to be filtered, which is contained in any suitable tank. It has legs to prevent it resting on the sediment at the bottom of the tank, and its lower portion is perforated for the passage of the liquid, which escapes through a flexible tube passed over the side of the tank.

6,427, Finishing Plaster Casts. F. Von Dechend, Berlin.

This is an apparatus and process for finishing and preserving plaster-casts. They are hardened, finished, and conserved by applying suitable fluids by a spray producer. The spray producer is a novel and ingenious mechanical arrangement which insures the complete dispersion of the preservative composition over the whole surface of the cast.

7,092, Pulleys. O. R. Olsen.

The hub, arms, and a narrow rim are first cast in one piece, and a rolled or sheet metal outer rim is then riveted over the outer one.

8,919, Flue Mouths. T. F. May.

The mouth of the flue or chimney is made gradually contracting as it rises from the fire-grate opening. This contracted portion may be made in one piece, or in sections joined together, the inside surface being smooth so as not to obstruct the draught.

11,163, Metallic Lathing. B. Scarles, Clinton, U.S.A.

Wire cloth is employed to receive the plaster. The strips upon which the wire cloth is secured are formed with a flange on each side by which they may be fixed in place with a longitudinal channel between them; they are rolled or struck from thin sheet metal, preferably galvanised iron, and are light and strong and easily bent into any desired shape for plastering concave, convex, or irregular surfaces. The wire-cloth is attached by staples, and the strips are fixed by nails passing through the flanges with heads that overhang.

APPLICATIONS FOR LETTERS PATENT.

Feb. 27.—2,648, W. Hayhurst, Cramps for Carpenters, Joiners, Cabinetmakers, &c.—2,663, J. Bogg, Drawplate for Domestic Fire Ranges, &c.—2,687, J. A. and J. Hopkinson, Hot-water Apparatus for Domestic and similar purposes.

Feb. 28.—2,691, C. Billington and J. Newton, Fastening Knobs to Spindles.—2,715, J. Oliver, Grate with Removable Grating for Fireplaces generally.—2,718, R. Adams, Self-closing Appliances and Cheeks for Doors, and Apparatus in Connexion therewith.—2,731, E. Deacon, Locks for Doors and other Purposes.—2,742, R. Golden, Improved Plastic Compounds.

March 2.—2,749, E. Taylor, Ventilating Apparatus for Application to Windows, &c.—2,751, S. Hurst, Improvements in Sash Fasteners.—2,767, E. Reynolds, Syphon Water Waste Preventer Cisterns.—2,771, J. Cast, Apparatus for Setting the Teeth of Saws.—2,775, W. Donald, Manufacture of Refractory Materials and Bricks.

March 3.—2,788, E. Prince, Adjusting and Fastening Windows without Sash Weights or Cords.—2,810, J. Watterworth, Improved Ornamental Panel Work.—2,817, E. Aldous, Ventilating Apparatus.

March 4.—2,839, J. Sturgeon, Laying Pipes and Mains in Streets for the Supply of Compressed Air or other Purposes.—2,859, L. Bickley and J. Winn, Paint Brush for Preventing Waste.—2,870, D. James and J. Harsant, Water Waste Preventers.—2,873, S. Kirby, Construction of Gully Traps.—2,881, E. Alexander, Heating Apparatus.—2,886, W. Millar and C. Nichols, Accelerating the Setting and Hardening of Cements.

March 5.—2,905. P. Walker, Improvements in Ventilators.—2,917, L. Groth, Heating and Disinfecting Apparatus for Urinals, &c.—2,919, W. Tebboth, Chimney Top, suitable also for Sanitary Ventilation.—2,926, J. Gagon, Draught and Dust Excluder for Doors.—2,927, W. Millar and C. Nichols, Fibrous Fireproof and Waterproof Composition for Constructive, Decorative, and other Purposes.—2,933, W. Hayward and W. Eckstein, Cellar Covers and Coal Plates.—2,934. A. Ransome and T. Wilkie, Improvements in Wood Planing and Moulding Machines.

PROVISIONAL SPECIFICATIONS ACCEPTED.

16,452, B. Badham, Combined Manhole Covers and Ventilators for Sewers.—16,883, J. Gullery, Combined Door Spring and Lock.—43, V. Bitzenhofer, Joining Inlaid Floors.—82, H. Curzon, Safeguard against the Bursting of Water-pipes from Frost.—728, T. and H. Grimbleby, Apparatus for Mechanically Shaping Roofing Tiles.—1,091, B. Sutcliffe, Machinery for Planing, Moulding, Grooving, Tongueing, and Thicknessing Woods.—1,928, T. Gelder and J. Wilson, Draw-plate for Fire Ranges.—2,069, J. Jeavons and G. Reynolds, Portable Dustbins.—390, F. Kellow, Building Bricks.—948, C. Longbottom, Improvements in Door or other Knobs or Handles, and Attaching same to Spindles.—1,132. J. Watts, Endless Band-saw Machines.—1,596, R. Wilson and Others, Improvements in Chimney Tops.—1,683, A. Clark, Improvements in Lathing.—1,961, W. Holt, Chimney Tops and Flues.—2,160, E. Colton, Improved Wall Decorations and Method of Manufacturing the same.—2,326, J. Smith, Mounting or Attaching Door Handles.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to opposition for two months.

4,259, E. Wright, Improved Chimney Cowl.—4,544, W. Johnson, Brickmaking Machinery.—7,111, J. Watson and J. Spoor, Kilns for the Manufacture of Portland Cement.—7,601, T. Messenger, Water-waste Preventers.—7,763, T. Watson, Improvements in Drain Pipes.—8,028, J. Mountain, Improvements in Water-closets.—23, D. Aubert, Apparatus for Opening, Holding, and Closing Ventilators, Skylights, &c.—1,493. J. Morrison, jun., and A. Emley, Fixing Handle Knobs of Doors to the Latch Spindles.—6,121, J. Tomkins and S. Napper, Improvements in Baths, Lavatories, &c.—7,015, T. Helliwell, Improved Method of Securing Sheets of Zinc or other Material for Roofing Purposes.—7,723, P. Dalton, Hot-water Apparatus for Warming Buildings, &c.—14,443, A. Putney, Wood Flooring, Ceilings, and Dados.—1,410, H. Pearson and G. Morris, Street Gullies and other Liquid Traps.—1,436, J. Wright, Seats and Covers for Water-closets, Privies, &c.—1,627, R. Evered, Improvements in Rack Pulleys for Window Blinds.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

MARCH 9.

By BLAKE, HADDOCK, & CARPENTER.

Croydon—The Haling Estate, freehold land, 116a. 2r. 0p. £20,000

By DOWSETT & WOODS.

Blackheath—Ground-rents of 74*l.* a year, reversions in 80 and 89 years 1,550
Clapton—A profit rental of 60*l.* a year, term 27 years 590
Sutton, High-street—Freehold land, with erections thereon 525

By MULLETT, BOOKER, & Co.

Hyde Park—22, Westbourne-terrace, with stabling, 52 years, no ground-rent 4,850

By Mr. WILLMOTT.

Shepherd's-bush—121, Godolphin-road, freehold ... 510

By HENRY DONALDSON.

Hornsey—Ground-rent of 33*l.* a year, reversion in 69 years 825
Kingsland—Nos. 65 to 75 odd, and 83, Tottenham-road, 30 years, ground rent 14*l.* 14s. 1,140
Islington—Nos. 14, 15, and 16, King Henry's-road, 40 years, ground-rent 9*l.* 560

By W. HALL.

Hendon—Ground-rents of 36*l.* a year, reversion in 98 years 720

By WAGSTAFF & WARMAN.

Upper Holloway—Nos. 29 and 30, St. John's Park, 66 years, ground-rent 14*l.* 980

MARCH 10.

By Messrs. KILOART.

Chiswick, Grove Park-gardens—"Brookville," 84 years, ground-rent 10*l.* 10s. 610

By A. & A. FIELD.

Highbury—137, Plimsoll-road, 92 years, ground-rent 5*l.* 15s. 285

MARCH 11.

By FULLER, HORSEY, SONS, & CASSELL.

St. Mary Axe—24, Bevis Marks, freehold, area 1,010 ft. 3,210

By THURGOOD & MARTIN.

Bedford-row—3, Prince's-street, freehold 860

MARCH 12.

By BRAY, WEBB, & Co.

Upper Holloway, Mercer's-road—"Glanville Villa," 82 years, ground-rent 13*l.* 725

By NORTON, TRIST, WATNEY, & Co.

St. Martin's-lane—4, West-street, freehold 680

By H. J. BLISS & SONS.

Bethnal-green—120 and 122, Sewardstone-road, 69 years, ground-rent 12*l.* 840
Mile-end—14, Maplin-street, freehold 330
Bethnal-green—14, Ellesmere-road, freehold 465
North Bow—55, Hewlett-road, freehold 405

By NEWBON & HARDING.

Tottenham-court-road—46, Warren-street, freehold 2,010
Burton-crescent—Improved ground-rents of 19*l.* a year, term 21 years 200
Barking—14, Wakering-road, freehold 470
Islington—39, Canonbury-square, 17 years, ground-rent 11*l.* 405

By E. STIMSON.

Camberwell—Ground-rents of 40*l.* a year, reversion in 58 years 680
Nos. 20 and 22, New Church-road, freehold 850
Borough—8 to 11, Pleasant-place, 81 years, ground-rent 15*l.* 545
Brixton—1 to 7, Dexter-road, 81 years, ground-rent 35*l.* 1,530
Old Kent-road—17 and 18, Surrey-square, freehold. 990
Bermondsey—2 to 16, Longley-street, 55 years, ground-rent 40*l.* 2,825

MARCH 13.

By R. J. COLLIER.

Edmonton—Stanley-road: Twelve houses, unfinished, 99 years, ground-rent 50*l.* 8s. 225
Tillotson-road—Eleven houses, unfinished, 99 years, ground-rent 46*l.* 4s. 205
Nos. 1, 3, and 5, Tillotson-road, 99 years, ground-rent 15*l.* 15s. 270

MEETINGS.

SATURDAY, MARCH 21.

Edinburgh Architectural Association.—Visit to Caroline Park and Granton Castle.

MONDAY, MARCH 23.

Surveyors' Institution. — Continued discussion on "Leasehold Enfranchisement." 8 p.m.

Society of Arts (Cantor Lectures).—Mr. J. Hungerford Pollen on "Carving and Furniture." III. Age of Gibbons, Boule, and that of their Successors. 8 p.m.

Inventors' Institute.—8 p.m.

Leeds and Yorkshire Architectural Society.—Mr. Walter Smith on "The Architecture of the Last Half-century."

Edinburgh Architectural Association. — Mr. William Bruce on "Timber-fronted Houses to Lawnmarket and Milne's-court." 8.30 p.m.

TUESDAY, MARCH 24.

Builders' Clerks' Benevolent Institution.—Seventh Annual Dinner (Holborn Restaurant). 6.30 p.m.

St. Paul's Ecclesiological Society.—Mr. Somers Clarke, F.S.A., on "Some Churches of North Germany (Lubeck, Luneberg, &c.)." 7.30 p.m.

London and Middlesex Archæological Society.—(1) Mr. G. L. Gomme on "The Westminster 'Folk-Moot.'" (2) Mr. John E. Price on "City Excavations: Recent Researches." 8 p.m.

Institution of Civil Engineers.—Mr. P. W. Willans on "The Electrical Regulation of the Speed of Steam-engines and other Motors for Driving Dynamos." 8 p.m.

Anthropological Institute.—(Three Papers.) 8 p.m.

WEDNESDAY, MARCH 25.

Carpenters' Hall, London Wall (Free Lectures to Artisans).—Mr. John Slater, B.A., on "Roof Coverings." 8 p.m.

Civil and Mechanical Engineers' Society.—Mr. H. A. K. Gribble on "The Oratory, South Kensington, from a Scientific Point of View." 7.30 p.m.

British Museum.—Mr. W. St. C. Boscawen on "Assyrian and Babylonian Antiquities." V.—(Chaldean and Assyrian Libraries.) 2.30 p.m.

Builders' Foremen and Clerks of Works' Institution.—Quarterly Meeting of Directors.

THURSDAY, MARCH 26.

Society for the Encouragement of the Fine Arts.—Mr. James Orrock on "The English Art." 8 p.m.

Society of Telegraph-Engineers and Electricians.—Professor Oliver Lodge on "The Seat of Electro-motive Force in a Voltaic Cell." 8 p.m.

Society of Antiquaries.—8 p.m.

FRIDAY, MARCH 27.

Royal Institution.—Professor Sir H. E. Roscoe on "The Sources of the Coal Tar Colours." 9 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. F. Platt on "The Compound Principles as Applied to Locomotive Engines." 7.30 p.m.

British Museum.—Prof. J. F. Hodgetts on "Mediæval English Remains." VI. (Sports and Pastimes.) 2 p.m.

SATURDAY, MARCH 28.

Architectural Association.—Visit to Fishmongers' Hall. 2 (*Two*) p.m.

Building Trades' Exhibition at Agricultural Hall.—Closing day.

Miscellanea.

The Suakim-Berber Railway.—A Parliamentary paper has been issued containing the articles of agreement between the Government and Messrs. Lucas & Aird in respect of the construction of the Suakim-Berber Railway. The agents, as the contractors are described, are to construct "for the War Department for the purposes of the expeditionary force sent out to Suakim, and according to the orders and under the control of the general officer for the time being in command of the same force, a 4 ft. 8½ in. gauge single line of railway from Suakim, and thence in sections to or so far towards Berber as may from time to time be ordered in writing by the Secretary of State; and also an 18 in. gauge single line of railway in or about Suakim, as may from time to time be ordered by the Secretary of State." The staff will be paid by the Government, and rationed and clothed by the War Department. If any of the working staff should be killed by the enemy in the Soudan, or die from wounds or from the effect of the climate, his representatives shall be entitled to a gratuity equal to one year's pay. The agents are to receive a commission of 2 per cent. upon all expenditure by the War Department, such commission not to exceed on the whole 20,000*l.*; and they will be entitled to a further sum not exceeding 20,000*l.* if the railways shall be satisfactorily completed in the judgment of the Secretary of State. There is a condition that the contract shall not be sub-let. Some dissatisfaction having been expressed in Parliament in consequence of an order for pumping engines in connexion with this railway having been given to an American firm, it is satisfactory to know that although this is the case, yet the order for the boilers, of which large numbers are required, has been placed with the well-known firm of Robey & Co., engineers, Lincoln.

Norfolk County Surveyorship.—Mr. T. H. B. Heslop, C.E., District Surveyor to the Kingston Highway Board, has been elected by the magistrates to the office of County Surveyor for Norfolk.

The Artisans', Labourers', and General Dwellings Company.—The eighteenth annual general meeting of this company was held on the 11th inst., Mr. Ernest Noel, M.P., presiding. The report showed that the rental for the year 1884 amounted to over 84,000*l.*, the net revenue being 57,610*l.*, out of which dividends upon the preference capital amounting to 12,073*l.*, and interim dividend upon the ordinary capital 20,832*l.*, had been paid. It was now proposed to pay a dividend of 5 per cent. on the ordinary share capital for the second six months of the year, carrying over 4,000*l.* to revenue reserve and 1,771*l.* to next year's accounts. The increase of capital during the year had been 125,290*l.*; the total amount paid up to Dec. 31 was 1,171,860*l.*, the authorised capital being 1,000,000*l.* in ordinary shares, and 750,000*l.* in preference shares 4½ per cent. The completed estates of the company in London are Shaftesbury-park, S.W., and Queen's-park, W., comprising nearly 3,400 separate houses. The cost of repairs upon these estates shows a decrease for the year as compared with 1883 of 1,047*l.* At Noel-park, N., the new estate of the company, work had been pushed on with rapidity, so that at the close of the year 743 houses, including those built or commenced in 1883, were completed, over 460 being let and occupied. This estate, when completed, will comprise 2,600 houses. The directors have had under consideration the question of acquiring a central site for the purpose of erecting block-buildings as dwellings for the industrial classes. The report and statement of account having been adopted, and the dividend declared, the retiring directors and auditors were re-elected.

Liverpool Engineering Society.—At the last meeting of this Society Mr. W. E. Mills, President, in the chair, a paper by Mr. J. J. Webster, Assoc. M. Inst. C.E., entitled "Notes on Constructional Ironwork," was read by the author. After referring to the enormous amount of ironwork used annually in the construction of warehouses and offices, as giving ample opportunities for studying the different modes of construction, he discussed the various forms of beams, and especially those of the rolled-girder type, and showed the errors of design occasionally committed. He said that the tables of safe loads given on published sheets of sections were not to be relied upon, and that in all cases the safe load should be calculated in each particular case as a check. He then went into the investigation of the strength of such beams, and showed how they could be calculated. The question of independent and continuous girders was then considered, and he showed how in many cases girders were designed and constructed as independent girders, yet from the nature of their position in the building and the application of the load they were actually acting as continuous girders, and should, therefore, have been designed as such. He next considered the different forms of joints and covers, and afterwards went into the investigation of columns.

Cemetery Chapels.—It is proposed, by the Local Board of Great Harwood, to lay out a cemetery, the area of which will be barely five acres; but some difficulty has arisen with regard to the erection of chapels, the Board, for economy's sake, desiring to erect one chapel, to be used in common by Churchmen, Dissenters, and Roman Catholics. Objections have been raised to the adoption of this course, and the Local Government Board sent down one of its inspectors (Mr. Stephen Terry) to hold an inquiry into the matter. It appeared from the evidence given by the architect (Mr. Angelo W. R. Simpson, of Blackburn) who had prepared plans for the cemetery, that the cost of one chapel would be about 620*l.*, while the erection of three separate chapels would cost nearly 1,200*l.* extra. It was suggested, as a compromise, that possibly three separate chapels under one roof could be erected for a total of about 1,400*l.* Do any of our readers know of so small a cemetery having three chapels, either under one roof or under separate roofs, or separately disposed upon the ground?

Coventry Sewage.—The Town Council of Coventry have decided to considerably enlarge the sewage works of their city to meet increase in population, and have instructed Mr. Melliss, C.E., to carry out the work. The sewage of Coventry has for the last ten years been dealt with by a combined system of chemical precipitation with filtration through land, and the operations have given general satisfaction.

Architectural Section of the Philosophical Society of Glasgow.—The closing meeting of the Architectural Section of the Philosophical Society of Glasgow was held on Monday evening last, Mr. James Sellars, the President, in the chair. Mr. W. P. Buchan read a paper on "The Past and Present Conditions of Plumber Work from their Sanitary Aspect." The paper was illustrated by several diagrams. In the course of the discussion which followed, Mr. Campbell Douglas said the great point that Mr. Buchan had urged on them was one that had been growing into their knowledge during the lass ten or fifteen years, for chemical science had demonstrated that gases were constantly arising from decomposing matter, and that steps must be taken to prevent these coming silently and insidiously into their houses. Mr. Whyte, the Assistant Master of Works, said that traps alone would never keep out gases, and that ventilation was equally necessary. He also agreed with Mr. Buchan in condemning the use of small two-gallon cisterns for water-closets. The Chairman proposed a vote of thanks to the lecturer, which was heartily agreed to. The election of office-bearers was then proceeded with. The following gentlemen were elected to office:—President, Mr. William Landless, architect; vice-presidents, Mr. David Thomson, architect, and Mr. Alexr. Muir, builder; treasurer, Mr. James Howitt, measurer; secretary, Mr. A. Lindsay Miller, architect; members of Council, Messrs. John Honeyman (architect), T. L. Watson (architect), Thos. Gildard (architect), James Sellars (architect), W. P. Buchan (sanitary engineer), John Dansken (measurer), William Howitt (measurer), C. T. Bowie (decorator), R. A. McGilvray (plasterer), Wm. Gilfillian (marble cutter).

Birmingham Architectural Association. The annual dinner in connexion with the Birmingham Architectural Association was held last Tuesday evening, at the Grand Hotel, Colmore-row. The President, Mr. F. B. Osborn, occupied the chair, and among those present were Messrs. W. H. Kendrick (Vice-President), Victor Scruton (Hon. Sec.), the Hon. R. Lyttelton, J. Cotton, A. Reading, F. Cross, F. G. Hughes, A. Hale, H. Clere, W. Doubleday, D. Arkell, J. K. James, H. Lloyd, F. Newton, J. Pratt, E. Taylor, T. Tonks, T. Camm, F. Spencer, Lukin Smith, F. Hart, &c. The President, in proposing the toast of "The Association," remarked that the Association was deserving of the most hearty support, as it was the only representative assembly of the profession of the art of architecture in the town, and also on account of the important educational work it was doing amongst students and younger members of the profession. Mr. Kendrick responded, suggesting that representations should be made to the Town Council for the establishment of a Technical Museum for the benefit of the profession, and observed that in the new Art Gallery accommodation might be found for a section devoted to the interests of the Association. Mr. Doubleday gave "The Health of the President," and urged that the Post-office authorities should be requested to allow the designs for the new Post-office to be confined to Birmingham architects.

Acton and the Thames Valley Sewerage Scheme.—Although the Acton Local Board has accepted tenders for the construction of a separate system of sewage disposal, at a cost of 75,000*l.*, it is understood that Sir Joseph Bazalgette has advised the Board to connect its district with the proposed Thames Valley scheme. Acton proposed to spend nearly 40,000*l.* on sewage precipitation works and an outfall into the river at Chiswick, the whole of which will be unnecessary if Acton determines to join the Thames Valley Scheme. Mr. Mansergh, one of the engineers of the Mortlake Scheme, has prepared a sewage diversion scheme for the Thames Valley which embraces even a wider area than that included in Sir Joseph Bazalgette's scheme. Besides the sewage of the Thames Valley, Mr. Mansergh proposes to divert at the same time that of the two districts of Brent (which include Hendon, Finchley, Edmonton, and the Barnets) and the Lea, which embraces Enfield, Edmonton, Tottenham, Walthamstow, and Leyton. The main sewer which will carry off the sewage of this wide area, commences at Hounslow, follows, but outside, the boundary of the metropolitan area, and ends at an outfall on the Mucking Flats, Sea Reach, where it is proposed to erect works for the chemical treatment of the sewage. The cost of the whole system is estimated at 1,045,000*l.*

Proposed Copper Trade Institute.—A Swansea paper states that an effort is being made to found a Copper Institute on the plan of the Iron and Steel Institute, and with every prospect of success. Some of the most important objects sought to be attained are to facilitate inter-communication between all persons connected with the trade, with regard to all matters relating to production, manufacture and use of copper or alloys, but excluding all questions of wages and trade regulations; to promote the more extended application of copper by making its properties and advantages more widely known; to facilitate the discussion at periodical meetings of practical and scientific questions appertaining to copper; to supply its members with reports of the prices, stock, consumption, and other statistics of copper; and to encourage exertions to promote the prosperity of the copper trade, by awarding medals and premiums for papers and inventions, which, after the discussion of their merits, may be considered worthy of such rewards.

The Late Sir Charles Freake.—An elaborately sculptured mural tablet, in alabaster and marble, has just been erected in St. Peter's Church, Cranley-gardens, by Lady Freake, in memory of her husband, the late Sir Charles James Freake, Bart., of Cromwell House, South Kensington, who was the founder and patron of the above church. Her ladyship has also erected a similar tablet in St. Paul's Church, Onslow-square, to the memory of Sir Charles, who built and founded this church also. The tablets are the work of Mr. Henry Terry, of the Lambeth-road.

The Civil and Mechanical Engineers' Society.—An ordinary meeting was held on the 11th inst., the President, Mr. Cole, A.M.I.C.E., in the chair, when a paper on "Steel Guns" was read by Mr. Charles Berthon (Lieut. R.A.). The author strongly advocated the abandonment of all other materials than steel for guns, and argued that it was not only the cheapest but the best material, and, in fact, would have been the material always employed but for the extreme difficulty of obtaining large masses of reliable quality.

Huish Episcopi.—A three-light Munich window has just been erected in the Parish Church of Huish Episcopi, Somerset, by Mrs. Michell, in memory of her husband, the late Major-General Michell, C.B., of the Royal Artillery. The subject illustrated is the "Angel at the Tomb," and the artists are Messrs. Mayer & Co.

Church Gasfittings.—Messrs. Jones & Willis, of Birmingham and London, have just completed, under the superintendence of the architects, the whole of the gasfittings for Holbeck Church, Leeds.—The same firm have also supplied the gasfittings and choir standards for St. Anne-in-the-Grove Church, Halifax.

TENDERS.

For the erection of two swimming-baths in Goulston-street, Whitechapel, for the Commissioners for Public Baths and Washhouses, Whitechapel. Mr. John Hudson, architect, 80, Leman-street. Quantities by Mr. C. Stanger:—

J. Ridout, Charrington-street	£6,187 17 0
A. Saunders & Co., East Dulwich	5,984 0 0
Paine Bros., Stamford Hill	5,977 0 0
W. J. Botterill, 110, Cannon-street	5,863 0 0
A. & E. Braid, Chelsea	5,812 18 0
McConnell, Sutton, Surrey	5,465 0 0
F. & F. J. Wood, Cleveland street	5,187 0 0
A. Reed, Burford-street, Stratford	4,997 0 0
W. J. Hack, North-street, Poplar	4,996 0 0
T. Norton & Son, Frederick-street, Stratford	4,977 0 0
J. R. Hunt, Bow Common	4,976 0 0
Lathey Bros., Battersea Park	4,900 0 0
O. T. Gibbons, New Broad-street	4,884 0 0
J. Greenwood, St. John-street, Mansfield, Notts	4,863 0 0
A. Eaton, High-street, Whitechapel	4,844 0 0
D. D. & A. Brown, Camberwell	4,841 0 0
Coulsell Bros., Bethnal-green	4,824 0 0
W. Marriage, Pancras-lane	4,800 0 0
J. Mowlem & Co., Westminster	4,780 0 0
T. Little, Size-yard, Whitechapel	4,770 0 0
Priestley & Gurney, Great Church-street, Hammersmith	4,700 0 0
W. Gregar, Stratford	4,660 0 0
G. Stephenson, Hampstead	4,593 0 0
John Bentley, Waltham Abbey	4,565 0 0
England & Thompson, Leytonstone	4,548 0 0
S. J. Scott, Bloomfield-street	4,533 0 0
W. Scrivener & Co., Fitzroy-road	4,492 0 0
Howell & Son, Lambeth Palace-road	4,427 0 0
J. Brickell, Manor Park, Essex	4,400 0 0
Mark Gentry, West Ham-lane, Stratford *	4,289 0 0
G. B. Colliver, Fleet-street	4,135 0 0
G. Roberts, South Norwood	4,093 0 0

* Accepted subject to the approval of the High Court of Justice and the Local Government Board.

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITIONS.

Nature of Work.	By whom required.	Premium.	Designs to be delivered.	Page.
Cemetery, Chapel, &c.	Lowestoft Burial Brd.	21*l.* and 10*l.* 10s.	April 27th	ii.
Public Baths	Cor. Bootle-cum-Linacre	50*l.*, 25*l.*, and 10*l.*	May 1st	ii.

CONTRACTS.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
National Liberal Club, Whitehall-place	.....	A. Waterhouse	March 23rd	xix.
Dust-Shoots, &c.	West Ham Local Brd.	Lewis Angell	March 24th	ii.
New Sewers	St. Giles's Brd of Wks.	G. Wallace	do.	xviii.
Kerbing, Tar Paving, &c.	Lewisham Brd. of Wks.	*Official*	do.	xix.
Honduras or Mexican Mahogany, &c.	Great Western Ry. Co.	do.	do.	ii.
Pipe Sewers, &c.	Wilmslow Local Board	John Bowden	March 25th	ii.
Wood Paving Blocks and Creosoting Same	Hull Corporation	J. Fox Sharp	March 26th	xix.
Macadamising and Paving Materials	do.	do.	do.	xix.
Drainage and Plumbing Works, also Repairs	Trstees, St. Brthlmew's Hospital, Chatham	.....	do.	ii.
Asphalte Carriageway and Footway Pavement	Commissionrs of Sewers	*Official*	March 27th	ii.
Paving Carriageways, Fleet-street, &c.	do.	do.	do.	ii.
Brick Chimney-Shafts	Met. Asylums Board	do.	do.	xix.
Enclosing and Fitting Show Yard	Somerset Agricultural Association	C. H. Samson	do.	ii.
Repairs and Alterations to Cemetery Chapels	Kingston Burial Board.	*Official*	March 28th	xix.
Enlargement of Post-Office, Newmarket	Com. of H.M. Works	do.	March 30th	ii.
Repair of Private Streets	Acton Local Board	C. Nicholson Lailey, C.E.	March 31st	ii.
Buildings for Pumping Machinery	Stockton and Middlsbro' Water Board	Jas. Mansergh, C.E.	do.	xviii.
New Coastguard Station, Sidmouth	Admiralty	*Official*	do.	ii.
Making-up Roads, Battersea	Wandsworth Bd. of Wks	do.	do.	ii.
Works and Materials	St. George-the-Martyr Southwark	do.	do.	xviii.
Ironwork for Footbridge, Cromford Station	Midland Railway Co.	A. A. Langley	April 2nd	ii.
Do. Codnor Park Station				
Girder and Corrugated-Iron Floor-Plates, for Bridge, Cudworth				
New Baths	Stockport Corporation	J. C. Prestwick	April 3rd	xix.
New Waterworks	Ely Local Board	E. Easton & Co.	April 4th	xviii.
Infectious Hospital	Reigate R. S. A.	Edward Larmer	April 7th	xxvii.
Alterations of Sewage Tanks	Wimbledon Local Brd	*Official*	do.	xix.
New Post-Office, Richmond	Com. of H.M. Works	do.	April 8th	ii.
Alterations and Additions to School	Rugeley Grammar School Governors	Ratcliffe & Holdsworth	do.	ii.
Restoration of East Dereham Church	.....	E. P. Willins	April 10th	ii.
Erection of Engine-House, &c.	Atherstone Rural Sanitary Authority	Baldwin Latham, M.Inst.C.E.	April 11th	xxvii.
Construction of Reservoir, &c.				
Cast-Iron Pipes, &c				
Engines and Pumps, &c.				
Building Houses, Poplar	Met. Asylums Board	A. & C. Harston	do.	ii.
Works, Brown's Wharf, Poplar	do.	do.	do.	ii.
New Works at Gosberton Risegate Eau Drain	Commissioners of Sewers	*Official*	April 12th	xxvii.
Elementary School	Birkdale School Board	C. A. Atkinson	April 16th	xxvii.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Inspector of Nuisances	Isle of Wight R. S. A.	125*l.*	March 25th	xvi.
Surveyor	Kingston Highway Bd.	200*l.*, with house, &c.	March 27th	xvi.

For the erection of the Forest School, with teacher's residence, for the School Board for Dagenham, Essex. Mr. John Hudson, architect:—

O. T. Gibbons, New Broad-street	£1,875	0	0
F. & F. J. Wood, Mile-end	1,739	0	0
Coulsell Bros., Bethnal-green	1,709	0	0
G. Roberts, Portland-road, South Norwood	1,700	0	0
W. Wood, Chelmsford, Essex	1,660	0	0
R. G. Walter, Ilford, Essex	1,625	0	0
J. Brickell, Manor Park, Essex	1,600	0	0
J. Baxter, Upton, Essex	1,560	0	0
Howell & Son, Lambeth	1,555	0	0
G. Barnes, Ilford, Essex	1,546	0	0
J. Bentley, Waltham Abbey, Essex	1,535	0	0
S. J. Scott, Bloomfield-street	1,533	0	0
J. J. Hammond & Son, Romford, Essex (accepted)	1,531	10	0
W. Gregar, Stratford, Essex	1,529	0	0
S. Woods, Weybridge, Surrey	1,500	0	0
England & Thompson, Howard-road, Leytonstone	1,445	0	0

Accepted for the erection of a factory in the High-street, Stratford, for Messrs. W. & C. Volckman. Mr. John Hudson, architect. Quantities by Messrs. Franklin & Andrews:—

Norton & Son, Stratford	£1,897	0	0

[No competition.]

For the erection of a villa residence in the Finchley New-road, West Hampstead, for Dr. W. G. Walford. Messrs. H Saxon Snell & Son, architects:—

H. & E. Lea	£2,487	0	0
W. Bamford	2,450	0	0
M. Manley	2,380	0	0
J. W. Dixon	2,349	0	0
Holliday & Greenwood	2,293	0	0
Mattock Bros.	2,255	0	0
Harris & Wardrop	2,187	0	0
Wall Bros.	2,176	0	0
Geo. Stevenson	2,125	0	0

For alterations and additions to "Grove Bank," Grove Park, Chiswick, for Mr. A. Pringle. Mr. W. S. Sargeant, architect:—

Parsons	£360	0	0
Arundel & Son	346	0	0
S. Hunt	318	0	0
Goodwin	414	0	0

[Architect's estimate, £350.]

For building warehouses at Blossom-street, Shoreditch, for Mr. Fish. Messrs. Gordon & Lowther, architects. Quantities supplied:—

Clarke & Bracey	£7,870	0	0
Patman & Fotheringham	7,620	0	0
Ashby Bros.	7,580	0	0
Winkles	7,381	0	0
Richardson Bros.	7,380	0	0
C. Barnes	6,811	0	0
Sabey & Son	6,798	0	0
Larter & Son	6,659	0	0
Little	6,479	0	0
Jas. A. Taylor	6,379	0	0
Simpson	6,254	0	0
Dye	5,798	0	0
Potter	5,750	0	0

Accepted for various works in the District of the Hornsey Local Board. Mr. T. de Courcy Meade, engineer and surveyor:—

Road Materials.

	Years.
Mr. Edward Heard, City Wharf, New North-road, Hoxton	3

Mason and Pavior's Work.

John Mowlem & Co., Grosvenor Wharf, Westminster	3

Asphalte Footway Pavement.

Compressed Asphalte: Val de Travers Asphalte Company, Palmerston-buildings Mastic Asphalte: French Asphalte Company, Cornhill	3

Sewer Jobbing Works.

Dunmore, Crouch End	3

Ironwork.

Butler, Gray's Inn-road, Holborn	3

For pulling down and rebuilding Nos. 3 and 4, St. Mary-at-Hill, for Sir H. W. Peek, bart. Mr. Alexander Peebles, architect. Quantities by Mr. W. E. Stoner:—

Colls & Son	£12,415	0	0
Hall, Beddall, & Co.	11,753	0	0
Brass & Son	11,624	0	0
Mowlem & Co.	11,185	0	0
Nightingale	10,975	0	0
Gentry	10,888	0	0
Conder	10,679	0	0
Morter	10,380	0	0
Clarke & Bracey (accepted)	9,964	0	0

For altering and enlarging the town-hall, Stratford, for the West Ham Local Board. Mr. Lewis Angell, architect. Quantities by Messrs. R. L. Curtis & Son:—

J. W. Wyles	£12,899	0	0
North Bros.	12,264	0	0
O. T. Gibbons	12,000	0	0
G. Stephenson	11,244	0	0
A. Reed	11,100	0	0
B. E Nightingale	10,871	0	0
F. Higgs	10,610	0	0
G. Roberts	10,290	0	0
M. Gentry	10,150	0	0
Howell & Son	9,965	0	0
C. Cox	9,964	0	0
J. Morter	9,943	0	0
W. Gregar	9,840	0	0
M. A. Palmer & Co. (accepted)	9,759	0	0

Accepted for the formation of a lake in Southwark Park, Bermondsey, for the Metropolitan Board of Works:—

Geo. Bell, Tottenham	£2,665	0	0

Accepted for the construction of sewers, &c., in the Pleck and Birchill Districts, for the Walsall Town Council. Mr. Arden Hardwicke, surveyor:—

Geo. Bell, Tottenham	£3,690	0	0

For new shop-front in High-street, Wolverhampton, for Mr. J. Steen. Mr. J. R. Veall, architect:—

Bradney & Co., Wolverhampton	£103	10	0
G. & F. Higham, Wolverhampton*	101	0	0

* Accepted.

Accepted for new Church Mission-room, Codsall Wood. Mr. J. R. Veall, architect, Wolverhampton:—

E. Moreton, Codsall	£224	0	0

[No competition.]

For forming roads and paths, and draining additional land at the Woolwich Cemetery, for the Burial Board. Mr. H. H. Church, Woolwich, architect:—

Knight, Northfleet	£1,718	8	6!
Ruttee, Bow	995	0	0
Carter, Anerley	920	16	0
Adams, Moorgate-street	775	0	0
Peill & Sons, Bromley	698	0	0
Budd, Lower Edmonton	685	0	0
Beadle Bros., Erith (accepted)	638	0	0
Hare, Clapham	590	0	0
Barnes, New Cross	585	0	0!

For new road and drainage, North Town, High Wycombe. Mr. Arthur Vernon, architect, High Wycombe:—

Stone	£487	17	0
Lacey	445	10	0
Free	428	1	10
Hill (accepted)	427	10	0

Accepted for restoring and enlarging St. Mary's Church, Alfrick, Worcester. Mr. Aston Webb, architect:—

J. Inwood, Malvern	£1,197	0	0

[Four other tenders received: highest, 1,348*l.*]

For additional class-room, and extending the infants' cloak-room, at the Maryland Point Schools, Leytonstone-road, Stratford, for the West Ham School Board. Mr. J. T. Newman, architect, 2, Fen-court, Fenchurch-street. Quantities supplied by Messrs. Curtis & Son, Nos. 119 and 120, London-wall, Moorgate-street:—

G. J. Hoskings	£866	0	0
Hearle & Son	849	0	0
W. Gregar	827	0	0
J. Cattley	836	0	0
A. Reed	797	0	0
J. Morter (accepted)	723	0	0

For the erection of vicarage house, for St. George's, Perry Hill, Catford. Mr. Gordon M. Hills, architect, Adam-street, Adelphi:—

Totens & Sons, Kensington	£2,600	0	0
Sikhs, Catford	2,340	0	0
Collins, Tewkesbury	2,296	0	0
Nightingale, Reigate	2,284	0	0
Goddard, Farnham	2,258	0	0
Jerrard	2,244	0	0
Jarvis & Sons	2,240	0	0
Cox, Beckenham	2,2 0	0	0
J. H. Tarrant & Son	2,197	0	0
Brown & Son, Harefield	2,196	0	0

Accepted for the construction of roads and sewers on the Park-road Estate, Crouch End. Mr. Wm. Hodson, jun., surveyor:—

Thos. Rowley, West-green	£1,495	0	0

For the erection of an addition to the brewery, Aston, Birmingham, for Messrs. J. Ansell & Son. Messrs. Davison, Inskipp, & Mackenzie, architects, 62, Leadenhall-street, London. Quantities supplied by Messrs. Curtis & Sons, London-wall:—

Contract No. 1.

Surman & Son	£1,070	0	0
Bloore	933	0	0
Jeffrey & Son (accepted)	850	0	0
Smith	842	0	0

[All of Birmingham.]

For alterations to the Star Brewery, Walton-on-Thames, for Messrs. Jason, Gurney, & Co. Mr. T. Willis, architect:—

Jas. A. Taylor	£479	0	0
Grant	465	0	0
Brown	385	0	0

Accepted for repairing eleven houses at Blythe Hill, Catford Bridge. Mr. Willis, architect:—

Jas. A. Taylor	£459	6	2

[No competition.]

For rebuilding No. 21, Goodge-street, on the Foyster Estate. Mr. Josiah Houle, architect:—

Spencer & Co.	£1,100	0	0
Kearley	1,116	0	0
Perkins	1,273	0	0

For alterations at the Prince of Wales public-house, North-street, Pentonville, for the City of London Brewery Company. No quantities:—

Jackson & Todd	£348	0	0
Spencer & Co.	335	0	0
Shurmur	324	0	0

For sewering, levelling, paving, flagging, metalling, and channelling the following private streets, namely, Daniel-street, Maria-street, Coke-street, Pepys-street, and Fernlea-road, for the Council of the borough of Harwich. Mr. Henry Ditcham, Borough Surveyor. Quantities supplied :—

Carter, Anerley	£2,549	1	9 !
Wood, Chelmsford	1,577	0	0
Capon, Manningtree	1,513	1	11
Saunders, Dedham	1,450	0	0
Adams, Moorgate street	1,410	3	7
Gunn, Harwich	1,407	4	6
Upson, Dovercourt	1,402	8	0
Trew, Ipswich	1,330	0	0
Moran, Harwich	1,311	19	0
Ridley, Dovercourt (accepted)	1,200	0	0
Trueman, Hackney	1,174	0	0
Street, Colchester	1,011	3	1½ !

[Surveyor's Estimate ..... £1,357 0 0]

For the erection of model lodging-house, Westminster. Mr. Byng T. Giraud, architect, 13, North-street, Westminster. Quantities by the architect :—

John Newton	£1,378	0	0
Geo. Howard	1,346	19	0
Benjamin Wells	1,303	0	0
Geo. Stephenson	1,244	0	0
Geo. F. Wright	1,217	5	3
A. Doughty	1,166	0	0
Geo. Ugle	1,159	0	0
John Garrud	1,137	0	0
Bray & Pope	1,130	0	0
Burrell & Norton	1,119	0	0
W. & F. Croker	1,100	0	0
Balaam Bros.	1,100	0	0
Ward & Lamble	1,187	0	0
Leeks & Hooker	1,160	0	0
Walter Holt	1,050	0	0
E. C. Howell & Son	1,050	0	0
Austin & Emery	1,040	0	0
T. Higgs'	1,030	0	0
G. O. Colliver	997	0	0
Geo. Roberts (accepted)	948	0	0

Accepted for the removal of earth and formation of streets, with the requisite drainage, on the Albion Estate, Stalybridge, for the Executors of the late Mr. Robert Platt. Mr. Gregory Gill, architect and surveyor, Stalybridge. Quantities by the architect :—

W. H. Worthington, Manchester	£800	0	0

For new day and Sunday schools at Newton Moor, Hyde. Mr. Gregory Gill, architect. Quantities by the architect :—

Aaron Haughton, Godley	£1,300	0	0
John Bredbury, Newton Moor	1,189	15	0
Edwin Simpson, Hyde	1,138	0	0
S. & J. Bennison, Dukinfield	1,098	0	0
Isaac Cropper, Dukinfield	1,075	0	0
Thos. Warrington, Newton Moor	1,035	0	0
Samuel Robinson, Hyde (accepted)	1,029	0	0
Shaw & Cazner, Stalybridge	1,025	0	0
Garside, Barns, & Co., Stalybridge	1,025	0	0
Castle Hall Sawmills Company, Stalybridge	1,000	0	0

Accepted for extensions to St. John's schools, Dukinfield, Cheshire. Mr. Gregory Gill, architect. Quantities supplied by the architect :—

James Crooks, Dukinfield	£376	0	0

For shops and alterations to property, for Mr. J. Swales, South Shields. Mr. Henry Grieves, architect :—

James Wills, South Shields	£350	0	0
Robert Allinson, Sunderland	319	7	6
Edward Anderson, South Shields	315	15	4
Haggerston & Ornsby, South Shields	289	10	0
Wm. Wilson, South Shields	283	16	11
Gilfillan Bros., South Shields	279	0	8
W. R. Gaudie, Jarrow	278	6	5
Jas. Nichol & Sons, South Shields	277	11	0
Jno. Yeeles, Jarrow (accepted)	250	0	0

For pulling down and rebuilding No. 15, Queen-street. Messrs. Spalding & Auld, architects. Quantities by Mr. G. Fleetwood :—

Higgs & Hill	£6,556	0	0
C. Ansell	6,496	0	0
J. Woodward	6,417	0	0
L. H. & R. Roberts	6,383	0	0
J. Morter	6,334	0	0
Colls & Sons	6,290	0	0
Patman & Fotheringham	6,271	0	0
Outhwaite & Son	6,190	0	0
Hall, Beddall, & Co.	6,184	0	0
Ashby Bros.	6,124	0	0
Martin, Wells, & Co.	5,600	0	0

For the erection of two cottages at Old Church-road, on Stepney Manor, for Mr. Freeman. Mr. H. F. Simmonds, architect, Cambridge Heath :—

Chilingworth	£310	0	0
Probert	230	0	0
Hardy	210	0	0

Works at Licensed Victuallers' Schools, Kennington.—Mr. Benjamin Cook, of Stonecutter-street, writes to say that in the list of tenders for new lavatories, &c., at the Licensed Victuallers' School, published in our last (p. 401), his tender was erroneously ascribed to "B. Cooper." The mistake was not ours. We printed the list as it was sent to us.

Schools, Shirley.—In reference to the list of tenders (published in our last, p. 402) for new schools in Spring Park-road, Shirley, near Croydon, we find that the name of the builder whose tender was accepted is Charles Bray (not Brass), of Wickham-road, Shirley.

SPECIAL NOTICE.—Lists of Tenders frequently reach us too late for insertion. They should be delivered at our Office, 46, Catherine-street, W.C., *not later than Four p.m.* on THURSDAYS.

TO CORRESPONDENTS.

P. J. M.—F. W. K.—T. L. W.—J. H.—F. W. R.—E. J. T. (received).—C. H.—L. de V. (shall have attention another week).—W. H. T.—P. E. M.—W. B. W.—W. R. (apply to a manufacturer of tar paving).—J. H. G. (cannot continue the correspondence).—A. K.—A Contractor (no space this week).—P. E. M. (we cannot continue the subject).—"Liberavi animam meam" (anonymous correspondents cannot liberate their minds in our columns. We may add the purpose for which the proposed alteration is to be made is by no means so despicable or worthless as you seem to imagine. No Mediæval architect would have hesitated for a moment to make the same kind of alteration for a similar purpose).

All statements of facts lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

PUBLISHER'S NOTICES.

GOOD FRIDAY.—"THE BUILDER" for the Week ending APRIL 4th will be issued on THURSDAY, the 2nd. Advertisements for insertion in that issue must therefore reach the Office before THREE p.m. on WEDNESDAY, the 1st. Alterations in standing Advertisements, or ORDERS TO DISCONTINUE the same, must be at the Office by TEN o'clock on TUESDAY Morning.

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Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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PERSONS Advertising in "The Builder," may have *Replies addressed to the Office*, 46, Catherine-street, Covent-garden, W.C. *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

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"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum, PREPAID. To countries within the Postal Union, 26s. per annum. Remittances payable to DOUGLAS FOURDRINIER, Publisher, No. 46, Catherine-street, W.C.

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See Stand F246, Building Trades' Exhibition.
Sole Manufacturers,
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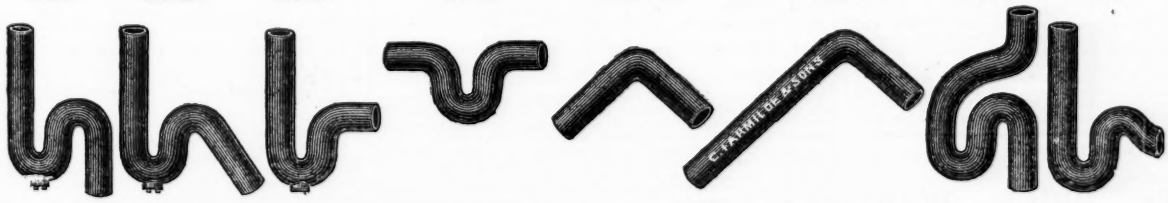

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Candidates must be not over forty years, nor under twenty-five years of age, and preference will be given to those persons who have had previous experience in the duties of the Office.
Applications in the handwriting of the applicants, and stating age and previous occupation, must be sent to me not later than FIVE o'clock in the afternoon of the 25th day of MARCH instant.
FREDC. STRATTON, Clerk to the Authority.
Newport, Isle of Wight, March 13th, 1885.